

About Sharing

by

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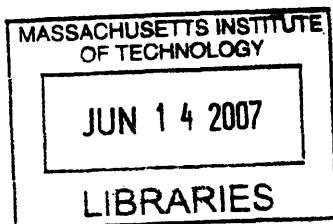
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Submitted to the Department of Linguistics and Philosophy
On June 1st in Partial Fulfillment for the Requirements of the
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ABSTRACT

This thesis is about multidominance or sharing in syntax. The term *sharing* is used in a technical sense, to refer to a situation where a syntactic node has more than one mother. I assume that multidominance is allowed by the grammar. I argue that sharing configurations are more diverse than it has been proposed. I identify two kinds of sharing: bulk sharing and non-bulk sharing. A string of multidominated material may be shared as a single constituent, resulting in a bulk sharing structure or its subparts may be shared individually, which results in a non-bulk sharing configuration.

I argue that all sharing structures are constrained by a single condition: *Constraint On Sharing* (COSH). COSH is a filter on derivations, which imposes an identity requirement on the sets of terminal nodes completely dominated by *horizontal* mothers of any shared node. Horizontal mothers are mothers that do not dominate each other. I propose that effects of COSH are reducible to conditions that must be satisfied for a structure to be linearizable.

Empirical evidence for COSH and non-bulk sharing comes from *Bi-Clausal Multiple Wh-questions* (BMWs), which I investigate in English and Croatian. In a BMW, two wh-phrases appear to be coordinated at the left periphery of the clause: “*What and where did Bob cook?*”. I present arguments that these questions are bi-clausal, with one wh-phrase belonging to each CP conjunct. Next, I propose an analysis of BMWs that involves non-bulk sharing constrained by COSH. I argue that this analysis explains the puzzling properties that BMWs have in both languages.

I show that while English has only BMWs, in Croatian there is also a construction that mimics a BMW in the surface string, but is actually a result of a very different derivation, one that involves only one clause with two wh-phrases. I refer to this structure as a *Coordinated Multiple Question* (CMW). I propose that the placement of second-position clitics in Croatian can disambiguate a BMW from a CMW.

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Writing this dissertation taught me why it is that Ph.D. programs end with dissertation-writing. It is so that you, the “dissertator”, stop feeling miserable about leaving the department and facing the big world out there. About ceasing to be “one of us” and becoming “one of them.” About the prospect of finding yourself at the other side of the great divide that separates (still!) *us*, students from *them*, professors. You spend a fair amount of time worrying about these things as you begin your final year (at least I did). And then the dissertation-writing happens, and before you know it, you can’t wait to become “one of them”! You find yourself thinking that the other side of the great divide is a place you want to be. You eagerly anticipate the joys of having the dissertation finished, bound and filed. And by the time it actually happens, you have already made your peace with the thought of facing the big world. And that is why we write dissertations.

I wrote mine with enormous help from all my committee members, starting with my Chair, David Pesetsky. I do not intend to acknowledge David about how great a linguist and teacher he is. It has been done before, and there is little new I could say in that respect (see numerous MIT dissertations that bear his signature). My personal and deep gratitude goes to David for being my mentor in every sense of the word, during the five years I spent at MIT. I want to thank him for always being there for me, not just by supporting my work and solving my linguistic problems, but also by literally ‘being there’ when, having had a baby at the beginning of my fifth year, I could only meet with David at odd times, and could use all the help I could get just to remember what my dissertation was about. I honestly don’t see how I could have done it if David had been less considerate.

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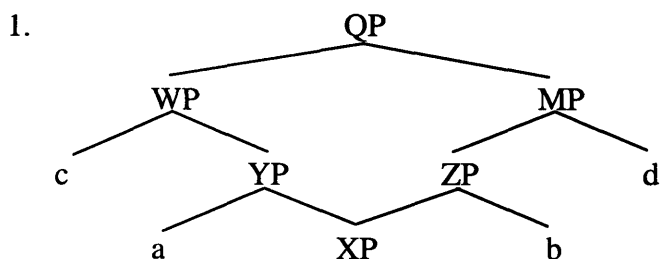
Special thanks are due to my family for supporting me, both emotionally and practically, throughout my "American adventure." My warmest gratitude goes to my husband, Eray, for his love and support throughout my Ph.D. program, and to my baby boy Jan, for loving me as much as he does even when I left him for hours-on-end in order to finish chapter such-and-such. Dedicate this work to him is the least I can do.

Chapter 1: Overview

This dissertation is an investigation of multidominance or sharing. I propose that sharing is in principle free and that the range of structures that involve shared material is more diverse than it has so far been proposed in the literature.

Let us first take a look at what it means for a node to be multiply dominated.

XP in (1) has two mothers, YP and ZP. This makes XP *multiply dominated* or *shared*.¹



Before we go on to discuss questions that arise once MD is proposed, let me introduce some terminology that will be helpful in defining relevant notions and constraints, and will also facilitate the discussion that follows. In the dissertation I will be using the term *immediately share* in a technical sense, defined in (2) below.

2. *Immediately share*

X and Y *immediately share* α if $X \neq Y$, and X is a mother of α and Y is a mother of α .

¹ The use of the term *sharing* in this dissertation is distinct from its use in the literature on gapping, most notably from its use in Lin (2002) and Johnson (2004). In these works, the term *sharing structure* is used to denote a structure in which two coordinated vPs share T^0 . In my work, the term *shared* is synonymous with the term *multi-dominated*: two nodes are shared if they have more than one mother nodes. This is not the case in the literature on gapping. See Chapter 4, section 4 for a discussion of gapping.

Thus, in (1), XP is *immediately shared* by YP and ZP. We also will wish to say that XP is *shared* between, for example WP and MP or YP and MP, although not all of these nodes *immediately share* XP. This intuition is captured by the definition of *horizontal sharing*, given in (3) below.

3. *Horizontally share*

X and Y *horizontally share* α if $X \neq Y$ and:

- i. X does not dominate Y and Y does not dominate X; and
- ii. X reflexively dominates X' and Y reflexively dominates Y', and
X' and Y' immediately share α .

The notion *reflexively dominates* is defined in (4).

4. *Reflexively dominate*

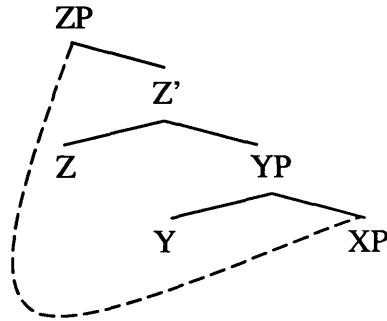
X reflexively dominates Y if

- i. X dominates Y, or
- ii. $X = Y$.

According to the definition in (3), the pairs of nodes that horizontally share XP in (1) are (YP, ZP), (YP, MP), (ZP, WP) and (WP, MP). Nodes that stand in a domination relation, for example, QP and MP do not horizontally share XP, according to the definition in (3).

The reference to *horizontal* in the term *horizontally share* is useful to distinguish the case of sharing illustrated in (1) from the case of sharing illustrated in (5) below.

5.



In (5), XP has been internally merged with a node that dominates it (Z'). In other words, it has been moved to a position higher than the position of its original merge. If we think about internal merge as *remerge* of a phrase with a node that dominates it (Blevins (1990), Frampton (2004), Bachrach & Katzir (2006)), we must conclude that following the remerge (or movement), XP in (5) has two mothers, YP and ZP. This means that XP is multiply dominated or shared.² To refer to the instance of sharing illustrated in (5), I will use the term *vertically share*, defined in (6).

6. *Vertically share*

X and Y *vertically share* α if $X \neq Y$ and:

- i. X dominates Y or Y dominates X, and
- ii. X and Y immediately share α .

Thus, in (5), YP and ZP vertically share XP, but neither YP nor ZP vertically share XP with Z'.

In the dissertation I will be using the term *share* as shorthand for the notion *horizontally share*.

Similarly, a *shared node* is to be understood as a node that is *horizontally* shared. I will refer to a node that is *not* horizontally shared as *an unshared node* (even though such a node may be

² Thus, according to the present proposal, movement does not involve creating copies of the element that moves. Rather, we are dealing with a single element, and what “movement” does is create multiple mothers of the element.

vertically shared). Whenever I need to make reference to sharing that results from internal merge, I will use the term *vertically share*.

Below, I give a brief overview of the phenomena that sharing analyses have been proposed for.

1. Background on sharing

Structures like (1) have been proposed in the literature to account for various phenomena. A sharing analysis has been proposed to account for the phenomenon of Right-Node Raising (RNR), illustrated in (7) (McCawley (1982), Goodall (1983), Levine (1985), McCloskey (1986), Muadz (1991), Moltmann (1992), Wilder (1999) and Bachrach & Katzir (2006)).³

7. John read and Mary only skimmed **the latest article about bats**.

Goodall (1983, 1987), Muadz (1991) and Moltmann (1992) propose that gapping, in (8), is also derived by sharing.

8. John **met** Sue and Mary Bill.

Goodall (1983, 1987), Muadz (1991), Moltmann (1992) and Citko (2000, 2005) propose a sharing structure for Across The Board (ATB) wh-questions, in which a single wh-phrase seems to move out of two (or more) conjoined TPs. An ATB question is illustrated in (9).

³ The bold-faced material is analyzed as shared.

9. **What** will John buy and Mary think Sam should read? (Citko 2000, ex. 40, pg. 48)

Citko (2000, 2005) proposes that free relatives, illustrated in (10), are also derived from a structure in which the *wh*-phrase that introduces a free relative (*whatever* in (10)) is multiply dominated by the matrix and embedded VPs. A similar proposal for free relatives is suggested by Van Riemsdijk (2006).

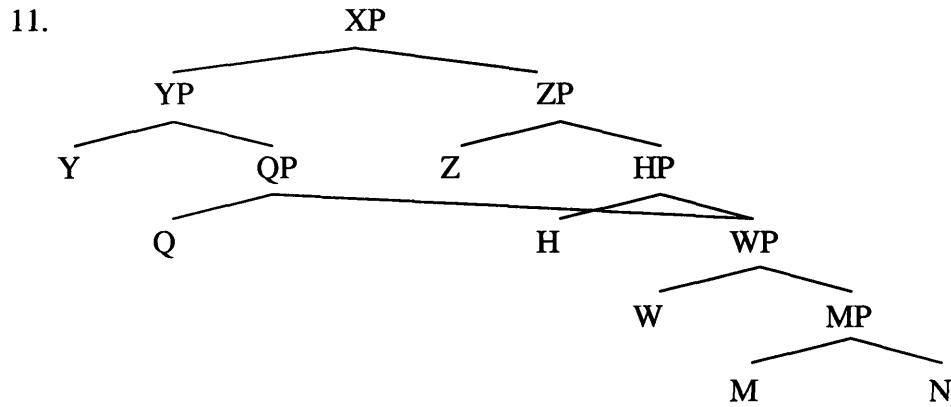
10. Gretel reads **whatever** Hansel recommends. (Citko 2000, ex. 81, pg. 72)

2. **Constraint on sharing (COSH)**

I assume that the grammar in principle allows sharing structures.⁴ It is tacitly assumed in the current literature on MD that, given a string of shared material, the only shared constituent is the smallest constituent that dominates *the entire string*, as illustrated in (11).⁵

⁴ This is not necessarily a trivial assumption. Citko (2005, pg. 475) argues that the operation needed for the creation of MD structures, Parallel Merge, is a 'natural consequence of Chomsky's (2001) view of phase structure and movement'. However, Chomsky (p.c.) points out that Parallel Merge has properties that distinguish it from both External and Internal Merge and has argued that a system that posits Parallel Merge is not a natural extension of the generative system that employs Merge as its sole (and unbounded) structure-building operation. In particular, Chomsky (2006, footnote 12, pg. 6) criticizes Parallel Merge as requiring 'new operations and conditions on what counts as a copy, hence additional properties of UG'. Given the empirical coverage of Parallel Merge, I assume that it is part of the grammar. However, further research is needed to determine how to resolve important theoretical considerations raised by acquiring a system that employs Parallel Merge.

⁵ Abbott (1976) discusses RNR and points out that the right-node raised material is not always a constituent. If RNR involves shared material, it follows from Abbott's discussion that a string of shared material may be shared even if it is not the case that the entire string is a single constituent (see examples (27) and (28) in this Chapter).



This implies that there exists a constraint in the grammar that requires a complex constituent, WP in the diagram (11), to be shared as a single unit, i.e. that material can only be shared “in bulk.” I refer to this kind of sharing as *bulk sharing*. In this dissertation I argue that the grammar does not contain such a constraint. In particular, I argue that a string may be shared so that its subparts are shared individually. On the other hand, we will see that such *non-bulk sharing* is allowed only under a special set of circumstances. I argue that these circumstances are governed by a Constraint On Sharing (COSH). COSH is given in (12).

12. *Constraint On Sharing (COSH)*

For any α , M, and N,

where $M \neq N$, and

- i M and N immediately share α , and
- ii M and N horizontally share α , and
- iii there is no node K that vertically shares α with both M and N⁶

For any terminal node β , M completely dominates β iff N completely dominates β .

⁶ Clauses (ii) and (iii) of COSH just say that α does not have a *single* highest mother (a single mother not dominated by another mother of α).

Both clauses (i) and (ii) are needed in the definition of COSH in order to prevent cases of movement (vertical sharing) from being ruled out by it.

The notion of complete dominance is defined in (13).

13. *Complete dominance*

α completely dominates β if every path from β upwards to the root includes α .

(Fox & Pesetsky, in preparation)

COSH can be informally paraphrased as follows: two mothers of a shared node that *horizontally* share it, must completely dominate identical sets of terminal nodes.

I argue that COSH is the *only* constraint on MD structures in the grammar. This means that sharing is in principle free, and a string may be shared either in a bulk or in a non-bulk manner, as long as the structure it appears in satisfies COSH.

Before we take a look at how COSH operates, let me note that COSH is a condition that holds of representations. Thus, a piece of structure that is ruled out by COSH at a certain stage in the derivation may still survive, if by the end of the derivation the structure conforms to it.⁷

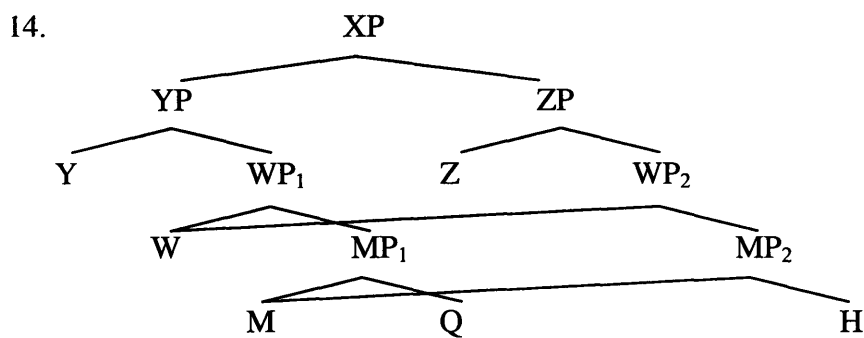
Finally, if COSH is correct, and I argue that it is, we would like to understand why it is so. In Chapter 3 I explore the possibility that effects of COSH are a consequence of principles of linearization, which we independently needed to linearize syntactic structures. I propose a linearization algorithm that is capable of linearizing MD structures and derives most (although

⁷ The reader will have noticed that, as it stands, the structure in (11) is ruled out by COSH. I will return to (11) in section 2.3.

not all) of the results that COSH accomplishes. The only case where the linearization algorithm makes different predictions from COSH is RNR. I discuss RNR in Chapter 4, section 2.

2.1. Non-bulk sharing, constrained by COSH

Let us now take a look at the representation in (14), which is an instance of non-bulk sharing.



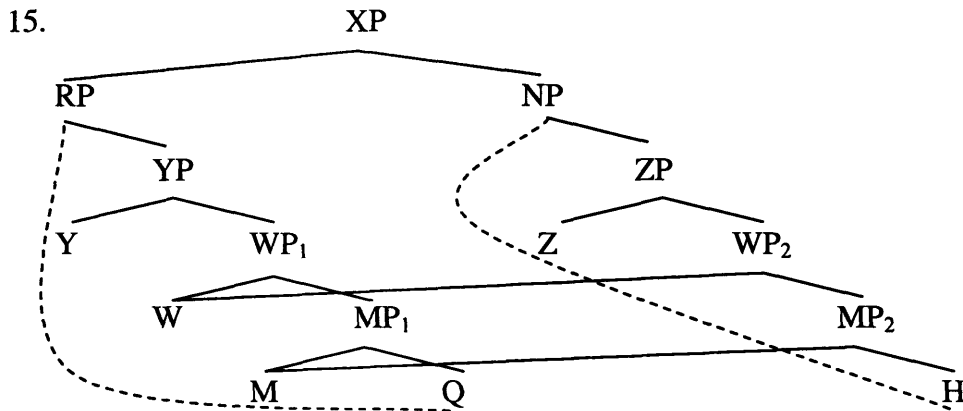
The two conjuncts in (14), YP and ZP, share two nodes, W and M.⁸ The representation, however, crucially differs from the one in (11) in that there is no node that dominates the shared nodes W and M to the exclusion of the unshared nodes Q and H. In other words, W and M do not form a constituent to the exclusion of Q and H. This makes it impossible for the string *WM* to be shared as a bulk. Thus, W and M must be shared individually. The question is whether (14) is a legitimate representation, i.e. whether it satisfies COSH.

It does not. Consider first W. It has only two mothers, WP₁ and WP₂, and they do not dominate each other. Note first that by our definition of complete dominance in (13), neither WP₁ nor WP₂ completely dominates W. Next, let us examine the set of terminal nodes that *are*

⁸ Recall that the term *share* is a shorthand notation for *horizontally share*.

completely dominated by WP_1 and WP_2 . WP_1 completely dominates Q , and WP_2 completely dominates H . This is because every path from Q upwards to the root includes WP_1 and similarly, every path from H upwards to the root includes WP_2 . Since $\{Q\}$ is *not identical* to $\{H\}$, COSH is not satisfied. The same conclusion emerges when we consider the other shared node, M . M also has only two mothers, MP_1 and MP_2 , that do not dominate one another, and neither completely dominates M . The set of terminal nodes completely dominated by MP_1 , $\{Q\}$, is not identical to the set of nodes completely dominated by MP_2 , $\{H\}$.

Suppose now that by the end of the derivation, Q and H move out of the WP_1 and WP_2 respectively, as illustrated in (15).



The representation in (15) conforms to COSH, since now the moved elements in the two conjuncts (Q and H) are no longer *completely dominated* by the two mothers of W , WP_1 and WP_2 . They are also no longer completely dominated by the two mothers of M , MP_1 and MP_2 . This is because, as mentioned above, movement is *remerge* of an element with a node that dominates it, as shown in (15). By virtue of being remerged with YP and ZP respectively, Q and H become multiply dominated themselves (vertically shared), since now each of them has two

mothers: Q has multiple mothers, MP_1 and RP , and H has multiple mothers, MP_2 and NP . Since now there is a path from Q to the root that does not include WP_1 and similarly, there is a path from H to the root that does not include WP_2 , it follows that WP_1 does not completely dominate Q and WP_2 does not completely dominate H. Since WP_1 and WP_2 do not completely dominate W or M, the set of nodes completely dominated by both WP_1 and WP_2 is reduced to the empty set. This makes the two sets identical, in accordance with COSH. The same holds of the two mothers of M. Because Q and H are remerged in a position that is higher than MP_1 and MP_2 , these nodes no longer completely dominate Q and H respectively. The set of terminal nodes completely dominated by both MP_1 and MP_2 is the empty set.

Note that COSH only rules out representations in which there is an unshared node, say Q in (15) above, which is completely dominated by one/some, but not all mothers of a shared node, for example M. COSH has nothing to say about unshared nodes that are *not completely dominated* by any mother of a shared node. Thus, unshared nodes Y and Z are not problematic either in (14) or in (15).

Let us now turn to examples that provide empirical support for COSH.

2.2. Bi-clausal Multiple Wh-questions: Evidence for non-bulk sharing and COSH

Empirical evidence for COSH comes from multiple wh-questions in which the wh-phrases seem to be coordinated, illustrated in (16) for English and in (17) for Croatian.

16. What and where did Sally sing?

English

17. Što i gdje Ivan pjeva?

Croatian

What and where Ivan sings

‘What and where does Ivan sing?’

One of the *wh*-phrases in both (16) and (17) is a direct object, and the other one is an adjunct. This is important because it rules out a possible derivation of (16) and (17) that involves a single clause where the *wh*-phrases are coordinated in the base position. This derivation is, however, possible for examples such as (18).⁹

18. [Which book and which person] did Bob remember [~~which book and which person~~]?

In this dissertation, I refer to strings like (16) and (17) as ***Wh&Wh***’s. Importantly, I reserve this term only for those questions in which a derivation in (18) can be excluded.

Cross-linguistically, *Wh&Wh*’s appear to derive from at least two different structures, one bi-clausal and one mono-clausal. I refer to the bi-clausal structure as a *Bi-clausal Multiple Wh-question* (BMW), and to the mono-clausal structure as a *Coordinated Multiple Wh-question* (CMW).¹⁰ In Chapter 2 I will argue for the claim that in English, sentences like (16) always involve a BMW structure, while Croatian allows both BMWs and CMWs.¹¹ In particular, I first argue that (16) is derived from two coordinated CPs. Evidence for this claim is given in Chapter 2, section 2. I further argue that the two underlyingly coordinated CPs, shown in (19), share all

⁹ If both *wh*-phrases are adjuncts, as in (i), it is unlikely that they are coordinated in the base position, given the proposals that different adverbs occupy particular (and distinct) positions in the structure (Cinque, 1999). Thus, (i) is probably a BMW.

(i) Where and when did Sally sing?

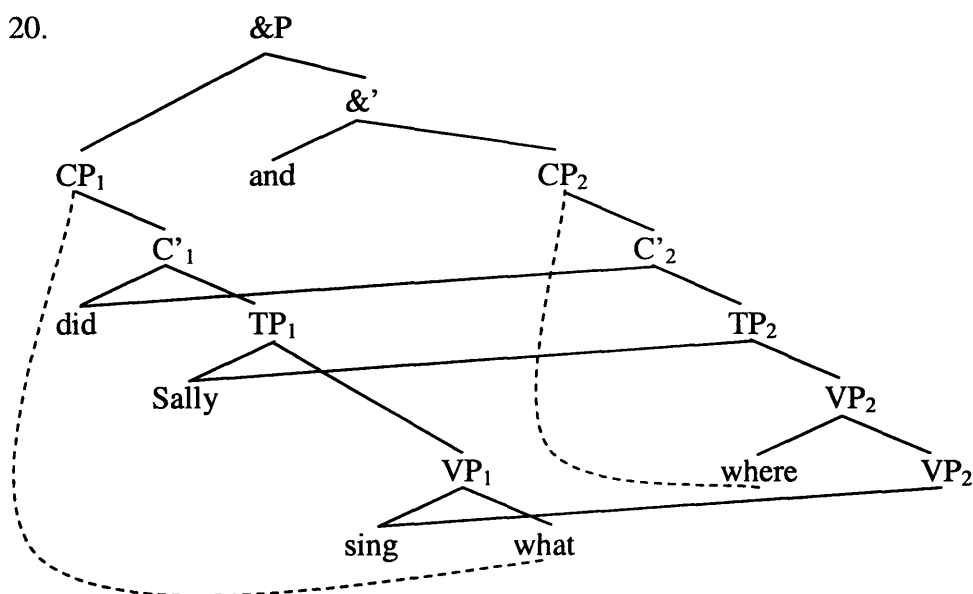
¹⁰ The term CMW is borrowed from Gribanova (2007).

¹¹ See Chapter 6 for a detailed discussion of CMWs in Croatian.

the terminal nodes (indicated by underlining), except the wh-phrases, *what* and *where*. Crucially, I present arguments that neither of the two conjuncts contains the wh-phrase that introduces the other at any level of representation.

19. [_{CP1} what did Sally sing] and [_{CP2} where did Sally sing]?

Thus, I argue that the BMW in (16) has the structure given in (20).

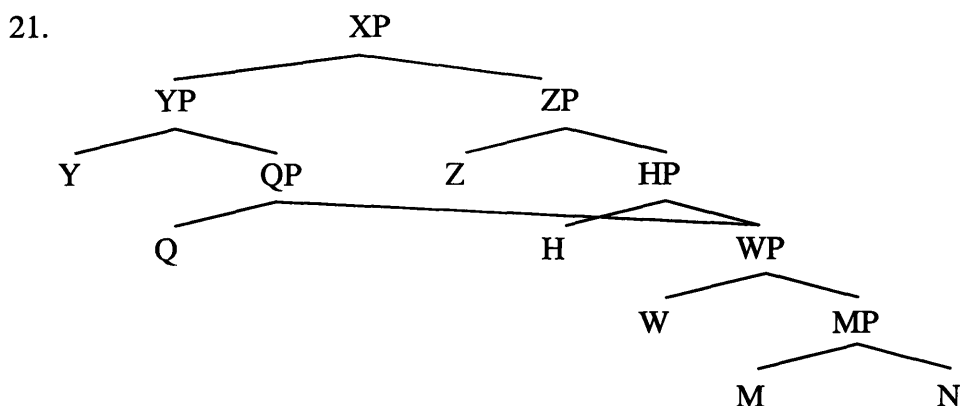


Structure (20) conforms to COSH, by virtue of having the same properties as (15) above. The mothers of the relevant shared nodes, *did*, *Sally* and *sing*, (VP, TP and C' in both conjuncts) all completely dominate the same set of terminal nodes, namely the empty set. Neither of them completely dominates the shared nodes, and in addition, they do not completely dominate *what* or *where*.

In Chapter 5 I argue that the properties of BMWs illustrated in Chapter 2 cannot be explained by other analyses that seem at first glance plausible, for example, backwards sluicing, ATB movement or bulk sharing. This leaves non-bulk sharing (constrained by COSH) as the most adequate analysis of BMWs.

2.3. Bulk-sharing and COSH

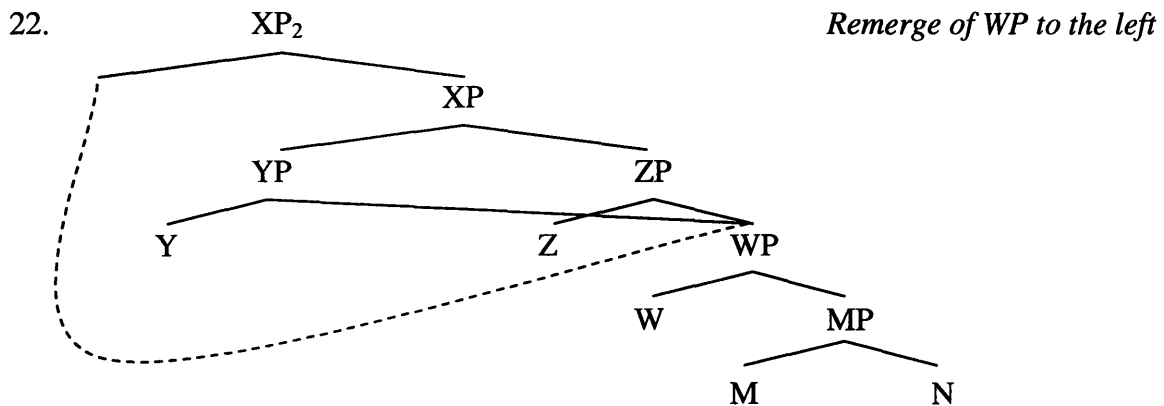
Let us now return to the representation in (11), repeated here as (21) for convenience.



COSH rules (21) out. The structure contains only one shared node (WP), which has only two mothers neither of which dominates the other (QP and HP). By our definition of complete dominance, QP completely dominates Q, and HP completely dominates H. Thus, the two sets of nodes completely dominated by QP and HP, {Q} and {H} are not identical, in violation of COSH.

There are at least two ways in which (21) can be made compatible with COSH. One is the solution that was employed in order to make (14) conform to COSH: to remerge both Q and H to a higher position, thus exempting them from complete dominance by QP and HP respectively.

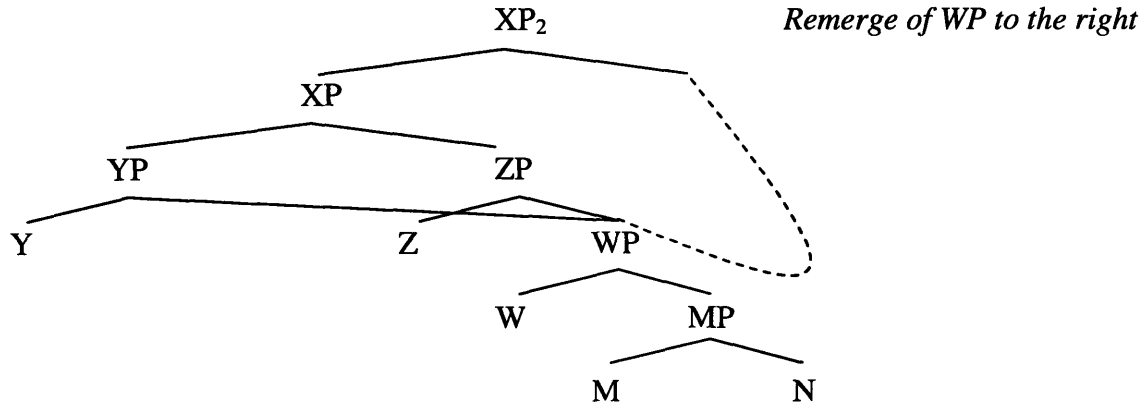
There is a second strategy that can eliminate the COSH violation in (21) – *remerging the shared node, WP, to a position that is higher than XP*. This strategy also rescues (21), although in a different way. The structure ends up vacuously obeying COSH, since moving WP to a position higher than XP – for example adjoining WP to XP – has the effect of creating a mother of WP, namely XP_2 , that *does* dominate all the other mothers of WP (YP and ZP). Having a mother that dominates all other mothers in a structure “exempts” a shared node from COSH, since the clause (iii) in the definition of COSH is no longer satisfied. The structures in (22) and (23) are therefore well-formed.^{12,13}



¹² The structure in (23) is the one proposed for RNR by Postal (1998), Sabbagh (in press), Fox and Pesetsky (in preparation) among others. I discuss RNR in Chapter 4, section 2.

¹³ Creating a mother that dominates all other mothers is in principle also available to shared nodes W and M in (14). However, this would require that W and M move to a position higher than XP independently of each other. This possibility is discussed in Chapter 5, section 5.

23.

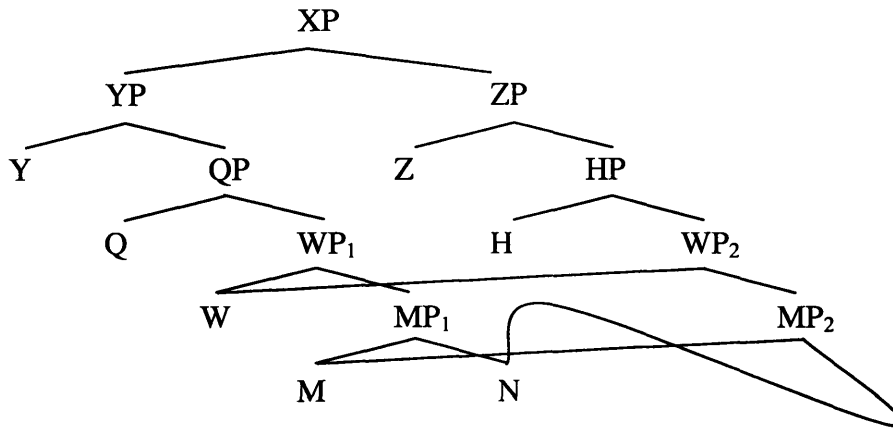


Thus, it is not the case that in this dissertation I argue against bulk sharing. In fact, I argue that sharing is free, and that *all* structures that satisfy COSH are legitimate, and therefore generated by the grammar, regardless of whether they instantiate bulk sharing, non-bulk sharing or no sharing at all.

3. Limitless non-bulk sharing?

I assume that a derivation proceeds by iterative application of Merge to lexical items and already formed syntactic objects, as in Chomsky (1995, pg. 243-260). Each instance of Merge creates a two-membered set, of the form $\{\gamma, \{\alpha, \beta\}\}$, where the first member, γ is the label, and the second member, $\{\alpha, \beta\}$ is a set containing objects that have undergone Merge. A derivation may be informally represented by a diagram we refer to as a syntactic tree. However, the tree notation is not quite precise, since a single derivation may map onto two different diagrams. For example, consider the diagram in (24), which involves a representation that looks quite different from that in (21). Moreover, while (21) is ruled out by COSH, (24) is not, as the reader may verify for herself. We might therefore think that (24) involves a derivation that differs from the derivation in (21), but this is in fact not the case.

24.



To make this obvious, it is helpful to think about the derivations in (21) and (24) in terms of sets, along the lines of Chomsky (1995).¹⁴

The first four steps in the derivation in (21) are given in (25). In the interest of clarity, the “splitting” of the workspace that occurs the moment WP in (21) becomes multiply dominated is represented by parallel derivations, one on the right, and one on the left of “|”. In (25) and (26), I call these derivations, Derivation 1 and Derivation 2.

25. Set-theoretic representation of the derivation in (21)

Derivation 1

Derivation 2

Step 1: {M, {M, N}}

Step 2: {W, {W, {M, {M, N}}}}

Step 3: {Q, {Q, {W, {M, {M, N}}}}} | {H, {H, {W, {M, {M, N}}}}}

Step 4: {Y, {Y, {Q, {Q, {W, {M, {M, N}}}}}}} | {Z, {Z, {Q, {Q, {W, {M, {M, N}}}}}}}

¹⁴ Under Chomsky’s assumptions about what syntactic objects may be put together by Merge, neither (21) nor (24) can be generated by the grammar. For present purposes, I gloss over these differences. See footnote 4 for relevant considerations.

In Step 3, which is the point in the derivation at which WP becomes multiply dominated, the set on the left hand side of $|$ is not identical to the set on the right hand side. The set on the left contains an element Q , while the set on the right contains H (Q and H are also the labels of the relevant sets). The same holds of sets created in Step 4.

Creating different sets in a sense *justifies* the splitting of the workspace. In other words, it is plausible to claim that a derivation m and a derivation n are different derivations if they involve creating different sets. Since sets are defined by their members, it follows that derivations differ iff an instance of the set-creating operation Merge in each derivation applies to different objects.

With this in mind, let us examine the derivation represented in (24). It differs from the derivation in (25) in that it involves workspace splitting from Step 1. The derivation is given in (26).

26. Set-theoretic representation of the derivation in (24)

Derivation 1	Derivation 2
Step 1: $\{M, \{M, N\}\}$	$ \{M, \{M, N\}\}$
Step 2: $\{W, \{W, \{M, \{M, N\}\}\}\}$	$ \{W, \{W, \{M, \{M, N\}\}\}\}$
Step 3: $\{Q, \{Q, \{W, \{M, \{M, N\}\}\}\}\}$	$ \{H, \{H, \{W, \{M, \{M, N\}\}\}\}\}$
Step 4: $\{Y, \{Y, \{Q, \{Q, \{W, \{M, \{M, N\}\}\}\}\}\}\}$	$ \{Z, \{Z, \{Q, \{Q, \{W, \{M, \{M, N\}\}\}\}\}\}\}$

Here, the sets formed in Steps 1 and 2 on either side of $|$ are *identical*. If an instance of Merge in a derivation m , creates the same set as an instance of Merge in a derivation n , then m and n are

not *two different derivations*. Thus, even though the tree in (21) looks very different from the tree in (24), inspection of the sets created in the course of each of those two derivation reveals that they are identical, i.e. that (26) is identical to (25). So, even though a representation in (24) is not ruled out by COSH, it is disallowed by the general principles of the set-theory, namely, that two sets are distinct only if they have different elements.¹⁵

The idea of allowing non-bulk sharing is not new. That it is possible has already been proposed in the literature, although indirectly and with some imprecision. Levine (1985) notes, for example, that a non-raising (or sharing) analysis of RNR is preferable to a raising analysis for the treatment of sentences where the “raised” element is not a constituent, as in (27), given in Abbott (1976).¹⁶

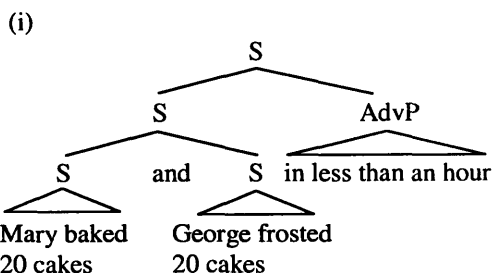
27. Mary baked and George frosted [twenty cakes] [in less than an hour].

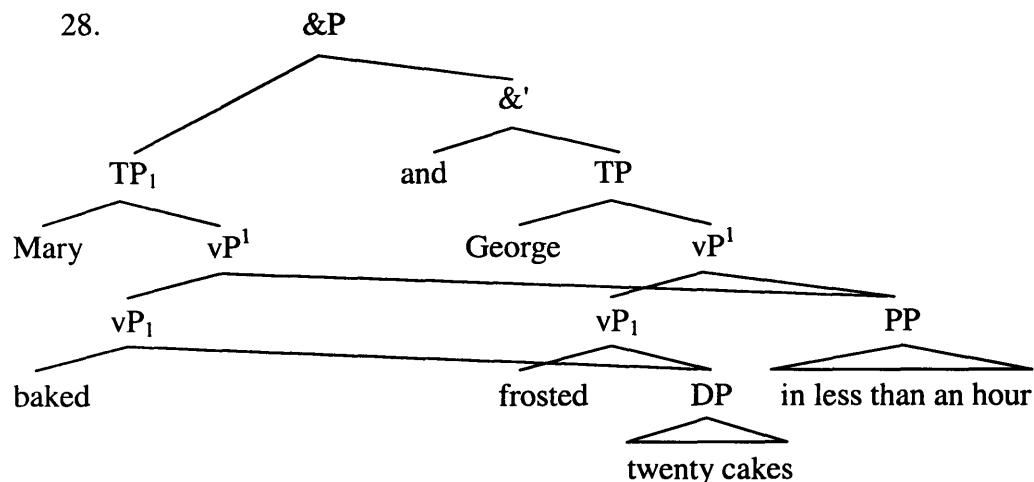
Assuming that RNR involves sharing of the material that seems to be right-node raised, the structure of (27) is that in (28).¹⁷

¹⁵ Note that the splitting of the workspace in Step 1 in (26) is only disallowed if derivation proceeds bottom-up.

¹⁶ Non-bulk sharing seems to be implicitly assumed for sentences like (27) in Bachrach & Katzir (2006).

¹⁷ Abbott (1976) hypothesizes that the structure of this example might be as in (i).





A representation like (28) amounts to non-bulk sharing, since there is unshared material, namely the verb in each TP (*baked* and *frosted*), that is sandwiched between the shared PP, *in less than an hour*, and the shared DP, *twenty cakes*. In other words, the shared string cannot be shared as a single constituent. We notice that COSH rules (28) out. However, we have by now seen two possible rescue operations that can save (28): one is to remerge the verb in each conjunct to a position where it will not be completely dominated by the mother of the shared PP, and the other is to move both the PP and the DP so that for each of them we create a mother that dominates all of its other mothers.

The theoretical contribution of this dissertation is not the idea of non-bulk sharing *per se*. It is rather the identification of the conditions under which such sharing is possible – namely, the claim that all unshared material that is at one point in the derivation completely dominated by the multiple mothers of the shared material must by the end of the derivation undergo movement. This accounts for the fact that *the surface string never contains shared material interleaved with unshared material*, even when the shared nodes are shared in a non-bulk manner.

Recall from section 2.2 that empirical evidence for COSH comes from BMWs, like that in (29), repeated here from (16).

29. What and where did Sally sing?

In Chapter 2 of the thesis, I present a detailed discussion of BMWs. We will see in section 2.1 of Chapter 2 that a BMW is only well-formed if it contains an optionally transitive verb, as opposed to an obligatorily transitive verb. Thus, (29) contrasts with (30) below.

30. *What and where did Sally buy?

Given that this contrast is crucial for the analysis I propose, I feel it is necessary to spell out for the reader the assumptions that I make about the representation of verbs such as *eat*, that are optionally transitive. I do so in the following section.

4. *Implicit Arguments*

Verbs like *eat*, *drink*, *sing*, *read*, etc. differ from verbs such as *buy*, *fix*, *hit*, *love*, etc. in that, unlike the latter, the former may surface with an overt argument or with an implicit one. The relevant contrasts are shown in (31) and (32).

31. a. John drank water.

b. John drank.

32. a. John bought water.

b. *John bought.

The alternation illustrated in (31) is commonly referred to as Indefinite/Unspecified Object Alternation or Indefinite/Unspecified NP deletion. I will use the term Optionally Transitive Verb (OTV) for verbs that appear in the alternation in (31).

In this section I discuss OTVs, with a particular focus on the *syntactic* status of their implicit arguments. I argue that in a BMW, the verb surfaces with an explicit argument (wh-phrase) in one conjunct and with an implicit argument in the other conjunct. It is therefore crucial for my analysis to reconcile the difference in transitivity of the verb across conjuncts with the fact that the verb is argued to be *shared*, and that we are therefore dealing with *a single lexical item*. I therefore adopt the view of optionally transitive verbs proposed in Chomsky (1965), according to which the OTVs are lexically subcategorized for an *optional* object, as in (33).

33. *eat*: V, [__ (NP)]

This view allows the requirements of the shared verb in a BMW to be satisfied in the VPs of both conjuncts: in one of the VPs, the verb cooccurs with an overt object, which is allowed by (33), and in the other it surfaces without it, which is again allowed by (33). The data from BMWs therefore give support to the ‘optional subcategorization’ approach to OTVs, over the proposals according to which they are either uniformly transitive (Bresnan (1978), Rizzi (1986), Zwicky (1987), among others) or involve two separate verbs in the lexicon, one transitive and

one intransitive (Fodor & Fodor (1980), Mittwoch (1982), Rice (1988). In the following paragraphs I outline these alternatives.

4.1. OTVs as True Transitives

Approaches to OTVs that I discuss in this section regard them as being true transitive verbs in the lexicon. The proposals differ as to whether OTVs are transitive in the syntax as well.

According to Belletti & Levin (1985), Zwicky (1987), Culy (1996), and Culicover and Jackendoff (2005), verbs with optional internal arguments have phonologically null lexical items in object positions. According to these authors, these null arguments are *syntactically present* in the structure. These verbs are uniformly transitive and the alternation in (31) arises due to the fact that in (31)a the object is overt, while in (31)b it is covert.

The problem with these proposals is the nature of the lexical item that is posited in the object position of an OTV. English does not seem to possess null pronouns (*pro*) that might fill the object position of the verb, and it is hard to see how a different null element, for example a PRO, might survive in the relevant configuration, since it normally cannot occupy an object position. For this reason, I reject this approach, even though my theory could be made compatible with it, if COSH were formulated so that it only pays attention to overt elements that are completely dominated by horizontal mothers of a shared node.

For ‘lexicalist’ approaches, such as Bresnan (1978), Hale & Keyser (1985), Rizzi (1986), Fellbaum & Kegl (1989), and Jackendoff (1990), the object theta-role of OTVs in English is discharged and satisfied in the lexicon. For these authors, although OTVs are *functionally*

transitive, they are *syntactically* intransitive. Thus, in these approaches, the implicit argument of an OTV is absent from the syntactic structure in which the verb appears.

Johnson's (2001) analysis is slightly different, in that he proposes that implicit arguments are intrinsic variables bound at LF by existential quantifiers.¹⁸ This approach is reminiscent of Bresnan's (1978) proposal, according to which the verb *eat* is transitive in the lexicon, but its argument structure can be converted from a two-place relation to a one-place relation by the variable-binding operation of quantification. Bresnan thus derives (34)b from (34)a, by an application of a lexical rule.

34. a. $x \text{ EAT } y$

b. $(\exists y) x \text{ EAT } y$

For Johnson, the intransitive *eat* is also interpreted as (34)b, but for him this interpretation is obtained at LF.¹⁹

None of these proposals, I think, is compatible with the data from BMWs that we will see in Chapter 2. The reason for this is that, according to these analyses of OTVs, by the time the verb is inserted into the syntactic structure, its object theta-role has either been saturated in the lexicon, or it has not been. Thus, if these proposals are correct, it is impossible for an OTV to be *shared* between two conjuncts, such that in one of them it is interpreted transitively and in the

¹⁸ A similar approach seems to be assumed in Romero (1998).

¹⁹ For arguments against this proposal, see Chapter 5, section 3.1.

other intransitively. Since this is exactly the situation we find in a BMW, I conclude that the lexicalist approach to OTVs is not correct.

4.2. An OTV as Two Verbs

Finally, Fodor & Fodor (1980) and Mittwoch (1982) propose that lexicon contains two entries for OTVs like *eat*, one transitive and one intransitive, as shown in (35).

35. *eat*₁: V, [__ NP]

*eat*₂: V, [__]

These authors argue against the view advocated by Bresnan (1978), that intransitive *eat* is represented as (34)b. Thus, their arguments are centered around the effort to show that there are important differences between (36)a and (36)b that are not predicted by Bresnan's proposal.

36. a. John ate.

b. John ate something.

Fodor & Fodor argue for (35) based on the observation that implicit arguments of OTVs obligatorily take narrow scope with respect to other scope-bearing elements in the sentence, as shown by the lack of ambiguity in (37)a. The sentence only has the reading in (37)b, but not the one in (37)c.

37. a. Everyone ate.

b. Everyone is such that there is something that they ate.

c. # There is something such that everyone ate it.

(Fodor & Fodor 1980, pg. 759)

Example (37)a crucially differs from (38)a, which *is* ambiguous between the readings in (38)b and (38)c.

38. a. Everyone ate something.

b. Everyone is such that there is something that they ate.

c. There is something such that everyone ate it.

Mittwoch (1982) shows that while *eat* is an activity predicate, *eat something* is an accomplishment. Hence, for example, the contrast in (39).

39. a. John ate (porridge) for 10 minutes.

(Mittwoch 1982, ex. 10, pg. 115)

b. *John ate something for 10 minutes.

(Mittwoch 1982, ex. 12, pg. 115)

Like the ‘lexicalist’ proposals discussed in 4.1, this view is also incompatible with the proposal advanced in this thesis. If the verb in the first conjunct of a BMW is transitive (*eat*₁), and the verb in the second conjunct is intransitive (*eat*₂), then the two are by definition different verbs. It is then implausible to claim that the verb in a BMW is shared. However, given that the data introduced and discusses in Chapter 2 strongly favor the analysis according to which the verb in

a BMW is shared, I cannot adopt the approach to OTVs according to which the alternation in (31) involves two different lexical entries.

Rather, as mentioned at the beginning of this section, I will assume that OTVs are listed in the lexicon as a single entry, subcategorized for an optional internal argument, as noted in (33), repeated here as (40).

40. *eat*: V, [__ (NP)]

Thus, an OTV may be thought of as an intransitive verb that can accommodate a direct object. Under this proposal, it is not surprising that in a BMW, a *shared* verb may have different adicity in each of the conjuncts.

With this much in mind, let us return to the main focus of the dissertation, the investigation of sharing.

Chapter 2: BMWs, Non-Bulk Sharing and COSH

1. Introduction

In Chapter 1 I outlined the claim that sharing is in principle free and that any given string may be shared either in bulk (so that the only shared node in the structure is the constituent that dominates the whole string), or in a non-bulk manner (so that its subparts are shared independently from one another). In this chapter, I present a construction, Bi-clausal Multiple Wh-question, illustrated in (1) for English and in (2) for Croatian, which I use to argue that the phenomenon of non-bulk sharing is real.

1. What and where did you eat?

English

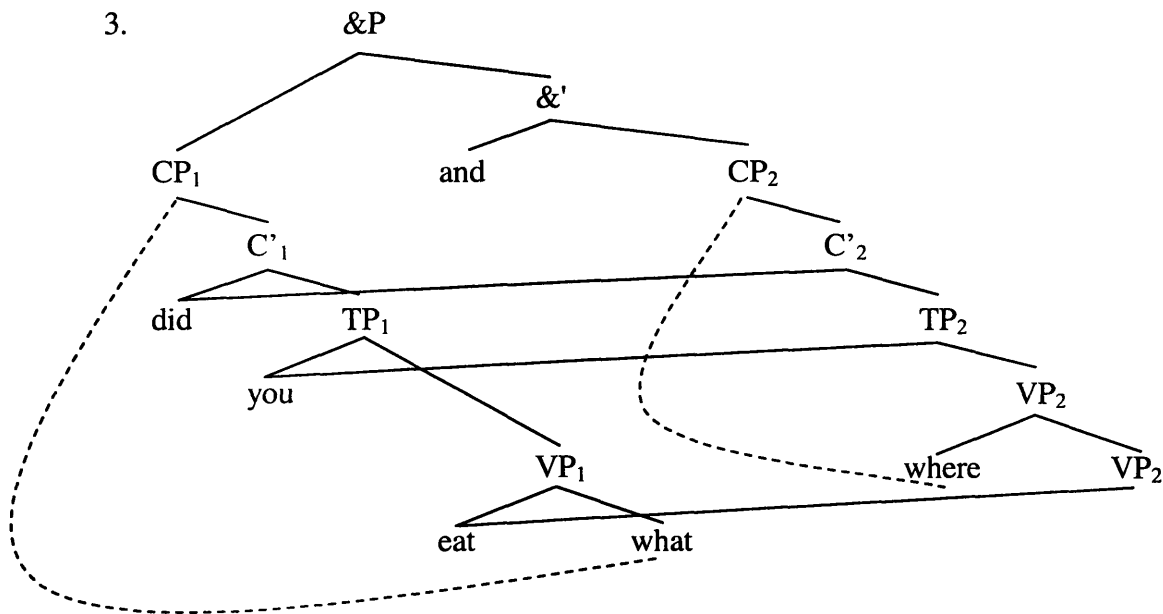
2. Što i zašto Petar jede?

Croatian

what and why Petar eats

‘What and why does Petar eat?’

I argue that a BMW has an underlying structure represented in (3) for the English example in (1).



Thus, a BMW is argued to involve a coordination of full-fledged interrogative clauses (CP_1 and CP_2), which share individual nodes, in our case *did*, *you* and *eat*, but do not share the wh-phrases *what* and *where*.

In this chapter, I discuss questions like (1) and (2), and argue that properties they display are best explained by the structure in (3).

2. BMWs in English

We have already seen, in (1) above, an example of wh-questions in English in which two wh-phrases appear at the front of the sentence, and they seem to be coordinated. In this section, I argue that appearances are deceiving in this construction. We will see that the underlying structure of strings like (1), which I refer to as *Wh&Wh*, in fact *always* involves a coordination of

interrogative CPs.²⁰ I refer to this structure as a BMW. I present arguments that the *Wh&Wh* in (4)a has the underlying structure in (4)b, i.e. that (4)a is a BMW.

4. a. What and where did Sally eat?
- b. What did Sally eat and why did Sally eat?

Support for this claim comes from several converging arguments. In section 2.1 we will see that a *Wh&Wh* becomes ungrammatical if it contains an obligatorily transitive verb. I argue that the reason for this is the fact that the wh-object, *what*, is not syntactically present in the clause introduced by the wh-adjunct. Another piece of evidence to this effect comes from the fact that a *Wh&Wh* may contain a subject depictive, but not an object depictive. This asymmetry, presented in section 2.2, again argues for the syntactic absence of the wh-object from the clause introduced by the adjunct wh-phrase. In section 2.3 we will see that the wh-object, *what*, is not interpreted in the same clause as the other wh-phrase. I will show that *Wh&Wh*'s like (4)a have only one kind of reading, which I call the *at-all*-reading, that crucially arises only in the absence of the object argument of the verb. A *Wh&Wh* is also ungrammatical if one of the wh-phrases is the subject (section 2.4). This fact receives a natural explanation under the present proposal, since in English an overt subject is required for a sentence to be well-formed. If in a BMW wh-phrases are not shared, it follows that if one of the wh-phrases is the subject, it will be absent from one of the conjuncts, which leads to ungrammaticality. Finally, in section 2.5 we will see that a *Wh&Wh* does not allow preposition stranding, even though regular multiple wh-questions

²⁰ Recall from Chapter 1 that the term *Wh&Wh* is reserved for those questions in which the wh-phrases are unlikely to have been coordinated in the base position.

in the language do.²¹ All of the evidence presented in this section thus argues for the claim that a question in (4)a is a BMW. Let us go through each piece of evidence in more detail.

2.1. Obligatorily vs. Optionally Transitive Verb in a BMW

The most striking evidence that a *Wh&Wh* in English obligatorily involves CP-coordination comes from the following contrasts.

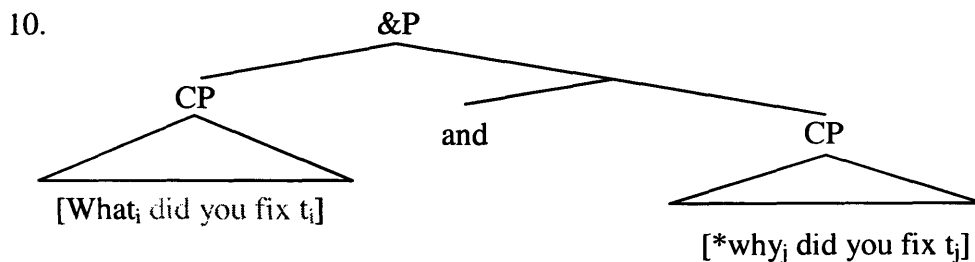
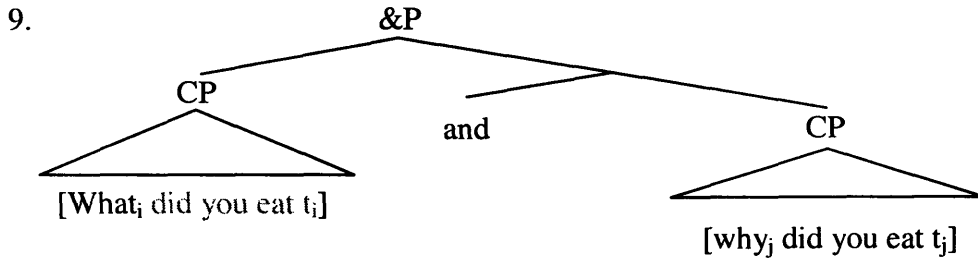
- | | |
|------------------------------------------|---------------------------------------|
| 5. a. What and why did you eat? | ✓ (<i>Transitive</i>) verb in a BMW |
| b. *What and why did you fix? | * <i>Transitive</i> verb in a BMW |
| 6. a. What and where did you sing? | |
| b. *What and where did you buy? | |
| 7. a. What and when did you dance? | |
| b. *What and when did you see? | |
| 8. a. Which juice and why did you drink? | |
| b. *Which juice and why did you sell? | |

Examples in (5) – (8) show that a *Wh&Wh* is grammatical in English only if the verb is optionally transitive. Consequently, only the (a) examples above are well-formed. The contrast between (a) and (b) examples in (5) – (8) is predicted by the present proposal that sentences in

²¹ In all these respects, *Wh&Wh*'s contrast with examples like (i), which presumably also involve bi-clausal structure. I assume that (i) is derived by sluicing of the TP in the second conjunct, as shown in (ii). Because the antecedent clause in (ii) contains a trace of the moved *wh*-phrase, I refer to this kind of sluicing as *trace-sluicing*. I discuss trace-sluicing in more detail in Chapter 5, section 3.1.

(i) What did you fix and why?
(ii) What_i did you fix t_i and why <did you fix t_i>

(5) – (8) are instances of a BMW. Underlyingly, the (a) examples contain two well-formed conjuncts, while in (b) examples the second conjunct contains a verb that is missing the internal argument. This leads to ungrammaticality. The simplified underlying structure of example (5)a is represented in (9), and that of (5)b in (10).²²



The contrast between (a) and (b) examples in (5) – (8) provides evidence that in English, the grammatical *Wh&Wh* strings are derived from coordinated CPs. The fact that nothing can save the (b) examples indicates that no other underlying structure is available.²³

²² For ease of exposition, in this section I represent the structure of a BMW as if it did not involve sharing. The reader should keep in mind, though, that this is only done for convenience. In particular, the shaded part of the first conjunct in the diagrams is just meant to indicate that this TP is *omitted*, and *not* that it has been elided.

²³ This is not true of comparable Croatian examples, discussed in section 3.3.

2.2. Subject vs. Object Depictives

Another piece of evidence that *Wh&Wh*'s in English involve coordinated CPs comes from the contrast illustrated in (11) below. Example (11)a, which contains a subject depictive, is grammatical, and (11)b, which contains an object depictive, is ungrammatical. This is expected if the two coordinated CPs both contain the subject, which is not a wh-phrase, while only one contains a wh-object. The second conjunct in (11)b is a CP, 'Why did Bob eat raw?', which is ungrammatical, ruling the whole sentence out.

- | | |
|----------------------------------------|-------------------------------------|
| 11. a. What and why did Bob eat drunk? | ✓ <i>Subject depictive in a BMW</i> |
| b. *What and why did Bob eat raw? | ✗ <i>Object depictive in a BMW</i> |

2.3. Interpretation of the grammatical BMWs

In previous sections we saw that in English, only those verbs that are optionally transitive can occur in a *Wh&Wh* in which one wh-phrase, but not the other is a direct object. We also saw that a *Wh&Wh* may contain a subject depictive, but not an object depictive. Both pieces of evidence argue for the syntactic absence of the wh-object from the clause introduced by the adjunct wh-phrase. In this section I focus on the interpretation of grammatical *Wh&Wh*'s (those that contain an optionally transitive verb).

In English, a *Wh&Wh* in (12) only has the reading in (13)a, but not that in (13)b.

- | | |
|-----------------------------------------------------|--------------------------------------|
| 12. What and why did you eat? | |
| 13. a. What did you eat and why did you eat at all? | ✓ <i>The at-all-reading of a BMW</i> |
| b. #What did you eat and why did you eat it? | ✗ <i>The it-reading of a BMW</i> |

I refer to the reading in (13)a as ‘the *at-all*-reading’, and to the one in (13)b as ‘the *it*-reading’. Confirmation for the fact that (12) does not have the *it*-reading in (13)b comes from the fact that the discourse in (14)a induces a strong feeling of contradiction, while that in (14)b does not.²⁴

14. a. #I know what you ate and why. But tell me, why pizza? ⊥
 b. ?I know what and why you ate. But tell me, why pizza?

If *Wh&Wh*’s in English could also be derived from a representation that does not involve two clauses (for example, by coordination of fronted *wh*-phrases), we would expect examples like (12) to be at least ambiguous between the two readings in (13), contrary to fact.

2.4. Coordination of the *wh*-subject and a *wh*-adjunct

The data presented in the previous sections support the claim that *Wh&Wh*’s in English are derived from two coordinated clauses. We saw several pieces of evidence that the clause introduced by the adjunct *wh*-clause does not contain (at any level) the argument *wh*-phrase. In other words, the “coordinated” *wh*-phrases always come from different clauses. Each *wh*-phrase is interpreted only in *its own* conjunct. Given this observation, we expect that in English, those *Wh&Wh*’s that contain a *wh*-subject are ungrammatical (since English requires that [Spec, TP] be filled by an overt subject). The ungrammaticality of the following examples shows that this prediction is borne out.^{25,26}

²⁴ For additional evidence for the fact that (14)a is a contradiction, see Chapter 5, section 3.1.

²⁵ Here, I use embedded, rather than matrix BMWs in order to avoid any confounding effect of movement of the auxiliary to C⁰, which would be required in the CP introduced by the adjunct *wh*-phrase, but not in the CP introduced by the subject *wh*-phrase. In the embedded BMWs, T-to-C movement is not required.

15. *Tell me who and when sang.

✗ *Wh-subject in a BMW*

16. *Tell me who and why ate.

17. *Tell me who and how fixed the sink.

18. *Tell me who and where gave a talk.

2.5. Preposition stranding

Finally, the claim that in English all *Wh&Wh*'s are BMWs is supported by examples in which one of the wh-phrases is fronted stranding a preposition behind. Native speakers report the following contrast.²⁷

19. a. ?About which phenomenon and why did you read a book?

b. *Which phenomenon and why did you read a book about?

This is also due to the bi-clausal structure of these questions. In (19)a, both conjuncts are well formed, as shown in (20), while in (19)b the second conjunct is missing the object of the preposition. This is illustrated in (21).

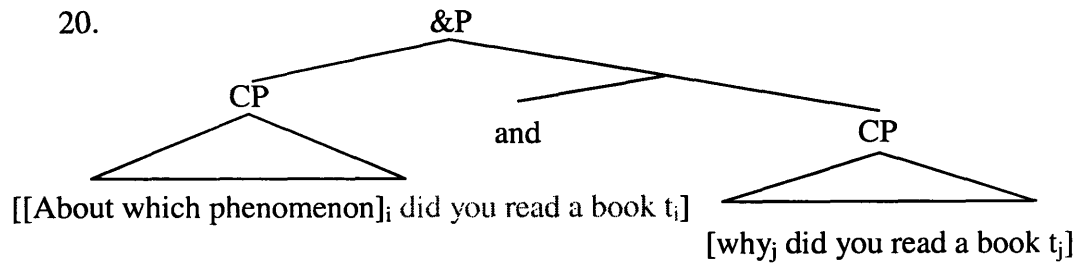
²⁶ Note that the badness of examples in (15) to (18) may not be attributed to the fact that the subject wh-phrase is not adjacent to the verb, since (i) below is also ill-formed.

(i) *When and who sang?

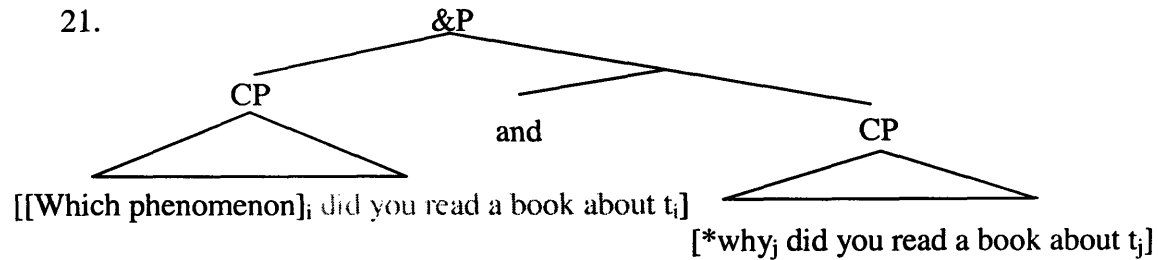
²⁷ Example (19)a is not perfect for most speakers, presumably because preposition stranding is independently preferred to pied piping. Thus, a single wh-question (i) is also somewhat degraded.

(i) ?About which phenomenon did you read a book?

20.



21.



The contrast observed in (19) is replicated in (22) – (24).

22. a. ?To who and when did you complain?

b. *Who and when did you complain to?

23. a. ?For who and where did you work?

b. *Who and where did you work for?

24. a. ?Of who and why are you thinking?

b. *Who and why are you thinking of?

The contrast in (19) and (22) – (24) is not expected if both wh-phrases originate in the same CP.

Preposition stranding in English multiple questions is not prohibited, as shown by (25).

25. Who did you talk *to* ___ about what?

Thus, if fronted *wh*-coordination were available for the English examples (19) and (22) – (24), we would expect all (a) and all (b) examples to be grammatical, contrary to fact.

3. BMWs in Croatian

In this section I discuss properties of *Wh&Wh*'s like (2) in Croatian. I show that in Croatian, a question like (2) *may* be parsed by a speaker as a BMW. I argue that if such a question contains two (sets of) clitics, one following each *wh*-phrase, then it may only be parsed as a BMW. Consequently, the repetition of clitics may be used as a diagnostic for a BMW. In this chapter I am only interested in BMWs, since only they are derived by non-bulk sharing. Thus, all Croatian examples in this chapter involve repeated clitics.

In section 3.1, however, I briefly note that it is also possible for clitics to not be repeated. If clitics are not repeated and they follow only the *first wh-phrase*, it can be shown that the underlying structure of such a question is mono-clausal, i.e. that it is a CMW (Coordinated Multiple *Wh*-question). If, however, clitics are not repeated and follow only the *second wh-phrase*, then the question is structurally ambiguous between a CMW and a BMW. For a detailed discussion of these cases, see Chapter 6.

Let us first take a look at why clitic repetition is an indication of a bi-clausal underlying structure of a *Wh&Wh*.

3.1. Clitic repetition

In Croatian, evidence that CP-coordination is a possible source of (2) comes from sentences that contain auxiliary and/or pronominal clitics. There are several options for the

position in which the clitics can be pronounced in such a question. Clitics can follow the first wh-phrase, as in (26)a, the second wh-phrase, as in (26)b, or they can follow both, as in (26)c.

26. a. Što MU JE i zašto Petar pjevao? *Wh1-clitics*

What him.cl Aux.cl and why Petar sung

‘What and why did Petar sing to him?’

b. Što i zašto MU JE Petar pjevao? *Wh2-clitics*

What and why him.cl Aux.cl Petar sung

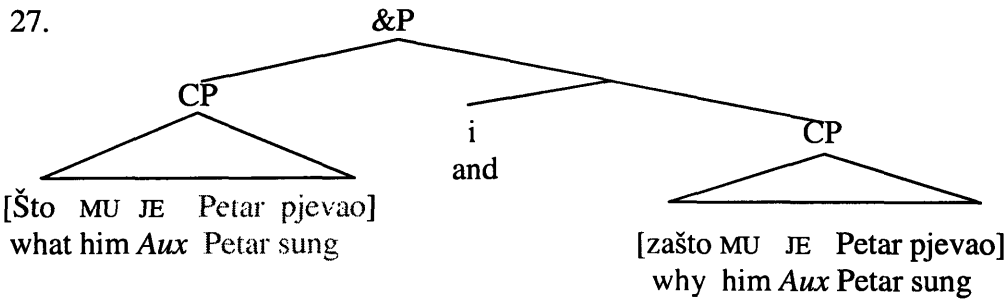
c. Što MU JE i zašto MU JE Petar pjevao? *Wh1-clitics, Wh2-clitics*

What him.cl Aux.cl and why him.cl Aux.cl Petar sung

Croatian clitics are second position elements – they must follow the first position in their CP. Either the first word or the first maximal projection may count as a first position.²⁸ Putting aside for the moment the clitic placement in (26)a and (26)b, which I will discuss in Chapter 6, let us focus on example (26)c. We know that clitics in Croatian occupy a high position: second in the clause. The fact that in (26)c a clitic cluster occurs *twice* suggests that the two conjuncts in the sentence are clausal, with clitics occupying the second position in each. This is illustrated in (27).²⁹

²⁸ The facts of clitic placement in Croatian are controversial. For the purposes of this work, this simplified description of clitic placement is sufficient. Furthermore, both prosodic (Halpern, 1995, Radanovic-Kocic, 1996, among others) and syntactic (Franks and Progovac, 1994, Progovac, 1996, 1998, 2005, among others) analyses have been proposed to account for the placement of clitics in the language. For our purposes, the exact nature of clitic placement is irrelevant. For concreteness, I assume that the placement of clitics is an output of syntax, but the arguments advanced in this dissertation equally hold if it turns out to be prosodic.

²⁹ The reader might notice that the size of the shaded material in the first conjunct in (27) might also be such as to include the clitics. This is indeed a possibility, giving rise to the clitic placement in (26)b. As mentioned in the main text, I discuss these examples in Chapter 6.



Under the hypothesis that the sentence in (26)c underlyingly contains only one CP (i.e. that *što* ('what') and *zašto* ('why') belong to the same CP), we would have a hard time explaining where the second set of clitics comes from. Such an analysis would not only require a (phonological) rule of clitic 'copying', but it would also have to stipulate that this rule is unique to *Wh&Wh*'s. This stipulation would be required because in sentences that clearly involve only one CP – in sentences with, for example, a coordinated-DP subject, clitics can follow the first conjunct (28)a, or the second conjunct (28)b, but they cannot be repeated (28)c. The sentence in (28)c does not have the reading in which the Romans and the Gauls were participating in the same war.³⁰

28. a. Stari Rimljani SU i Gali međusobno ratovali.
 Old Romans *Aux.cl* and Gauls with-each-other waged-war
 'The Old Romans and the Gauls were at war with each other.'
- b. Stari Rimljani i Gali SU međusobno ratovali.
 Old Romans and Gauls *Aux.cl* with-each-other waged-war
 'The Old Romans and the Gauls were at war with each other.'

³⁰ Clitics can, in fact, also follow the first word of the first conjunct, as in (i). As far as the present proposal is concerned, this possibility is equivalent to the placement in (28)a.

(i) Stari su Rimljani i Gali međusobno ratovali.
 Old *Aux.cl* Romans and Gauls with-each-other waged-war

c. Stari Rimljani SU i Gali SU međusobno ratovali.

Old Romans *Aux.cl* and Gauls *Aux.cl* with-each-other waged-war

#‘The Old Romans and the Gauls were at war with each other.’

‘The Old Romans were at war amongst themselves and the Gauls were at war amongst themselves.’

The fact that repeating the clitic changes the meaning of the sentence suggests that clitic repetition is an indication that what is coordinated is not just the DP subjects, but rather bigger constituents, in fact clauses. Support for this claim comes from the fact that clitic repetition is incompatible with a collective predicate, such as *meet*. This is illustrated in (29).

29. a. Petar i Marko ĆE SE sresti u pet popodne.

Petar and Marko will.cl refl.cl meet in five afternoon

‘Petar and Marko will meet at five in the afternoon.’

b. *Petar ĆE SE i Marko ĆE SE sresti u pet popodne.

Petar will.cl refl.cl and Marko will.cl refl.cl meet in five afternoon

Clitic repetition is thus evidence that a *Wh&Wh* may be derived from coordinated CPs. For examples such as (26)a and (26)b, however, other underlying structural representations cannot be ruled out. We will in fact see that *Wh&Wh*’s in Croatian *may* be derived from a single underlying CP. I defer the discussion of this derivation and of examples like (26)a and (26)b to Chapter 6. In the rest of this chapter, I will only examine examples with two sets of clitics, which

unambiguously indicate a bi-clausal structure. In the following sections I present additional evidence in support of the claim that Croatian has BMWs.

3.2. The Absence of *the it-reading*

Like English *Wh&Wh*'s discussed in section 2.3, Croatian *Wh&Wh*'s with two sets of clitics are also unambiguous with respect to interpretation. Example (30) only has the reading in (31)a. If the *zašto* ('why')-clause in (30) does not contain the *što* ('what')-phrase, the *at-all*-reading in (31)a is predicted. Furthermore, given the absence of the *it*-reading in (31)b, the CP-coordination seems to be the only representation from which (30) can be derived.

30. Što SI MU i zašto SI MU pjevao?

What *Aux.cl* him.cl and why *Aux.cl* him.cl sung

'What and why did you sing to him?'

31. a. 'What did you sing to him and why did you sing to him at all?' ✓ *The at-all-reading*

b. # 'What did you sing to him and why did you sing that thing to him?'

✗ *The at-all-reading*

The interpretation of examples like (30) constitutes another piece of evidence that clitic repetition indeed is an indication of a BMW in Croatian.

3.3. Obligatorily vs. Optionally Transitive Verb in a BMW

We have just seen that the repetition of (identical) clitics in a question like (26)c argue for a bi-clausal underlying structure. (Obligatory non-distinctness of clitics in Croatian BMWs is discussed in section 6.2 of this chapter.) The proposed analysis predicts that the contrast we saw in (5) – (8) for English *Wh&Wh*'s, involving optionally vs. obligatorily transitive verbs, holds in Croatian at least for those *Wh&Wh*'s in which clitics are repeated. This prediction is borne out, as shown by (32)a and (32)b.

32. a. Što SI MU i zašto SI MU pjevao? ✓ *(Transitive) verb in a BMW*

What *Aux.cl* him.cl and why *Aux.cl* him.cl sung

‘What and why did you sing to him?’

b. *Što SI MU i zašto SI MU popravio? ✗ *Transitive verb in a BMW*

What *Aux.cl* him.cl and why *Aux.cl* him.cl fixed

‘What and why did you fix for him?’

The present proposal readily accounts for the contrast in (32): if the surface strings in both examples are derived from coordinated clauses, as indicated by two sets of clitics, the second conjunct in (32)b contains a verb that is missing an obligatory direct object; its subcategorization requirements are not satisfied, which leads to ungrammaticality. Therefore, both (32)a and (32)b underlyingly contain coordinated CPs.

3.4. Subject vs. Object Depictives

Just like English *Wh&Wh*'s, Croatian examples with repeated clitics also show a contrast between those that contain a subject depictive and those that contain an object depictive. This is illustrated in (33).

33. a. Što je i kada je Petar jeo pijan? ✓ *Subject depictive in a BMW*

What *Aux.cl* and when *Aux.cl* Petar eaten drunk

‘What and when did Petar eat drunk?’

b. *Što je i kada je Petar jeo sirovo? ✗ *Object depictive in a BMW*

What *Aux.cl* and when *Aux.cl* Petar eaten raw

*‘What and when did Petar eat raw?’

The source of ungrammaticality is again the fact that the ungrammatical sentence in (33)b contains an ill-formed conjunct, **Kada je Petar jeo sirovo?* (‘*When did Petar eat raw?’). In the grammatical (33)a, both conjuncts are well-formed: *Što je Petar jeo pijan* (‘What did Petar eat drunk’) and *Kada je Petar jeo pijan?* (‘When did Petar eat drunk’). The contrast between availability of subject vs. object depictives supports the claim that in Croatian repeated clitics are diagnostic of a BMW.

In this section we saw evidence that Croatian has BMWs. The reader might observe that neither preposition stranding nor the coordination of subject-wh and adjunct-wh was mentioned as evidence for CP coordination in Croatian. The reason why preposition stranding is omitted is

the fact that the language independently disallows it. The sentence in (34) is ill-formed. Thus, preposition stranding in a Croatian *Wh&Wh* is uninformative of its structure.

34. *Čemu si razmišljao o?

what.LOC Aux.cl thought about

‘What were you thinking about?’

As to the coordination of a *wh*-subject, Croatian BMWs with repeated clitics are indeed *not* ungrammatical when one of the coordinated *wh*-phrases is the subject. This is expected, however, because (unlike English) Croatian is a *pro*-drop language, as shown in (35).

35. Kad MU JE pjevao?

When him.cl Aux.cl sung.3.SG.M

‘When did he sing to him?’

This allows for a *pro* to be inserted into the second conjunct and easily accommodated, if the sentence is otherwise grammatical. Thus, (36) contrasts with the English examples (15) – (18), because in Croatian, the underlying representation shown in (37) is a possible one.

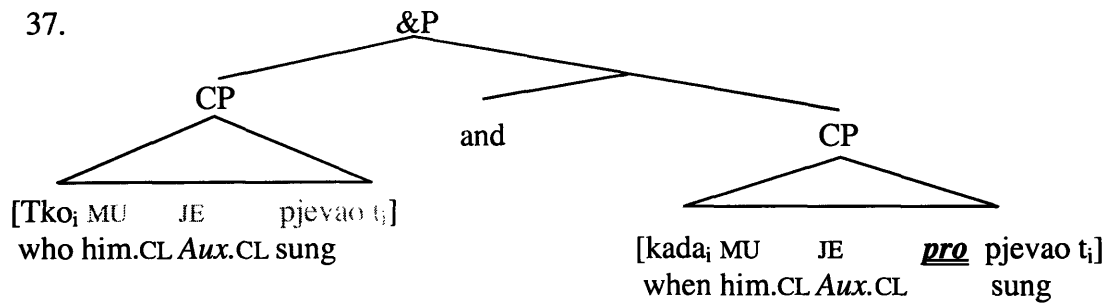
36. Tko MU JE i kada MU JE pjevao?

✓ *Wh-Subject in a BMW*

Who him.cl Aux.cl and when him.cl Aux.cl sung

‘Who and when sang to him?’

37.



4. Interim Summary

So far we saw evidence that both Croatian and English have a BMW. In fact, we came to the conclusion that in English, a *Wh&Wh* can only involve underlyingly coordinated CPs, i.e. that the two *wh*-phrases *cannot* come from the same clause. We also saw that in Croatian, *Wh&Wh* may contain two (sets of) clitic(s), which we took to be evidence that the conjuncts must be clausal. Evidence for BMWs in English and Croatian included:

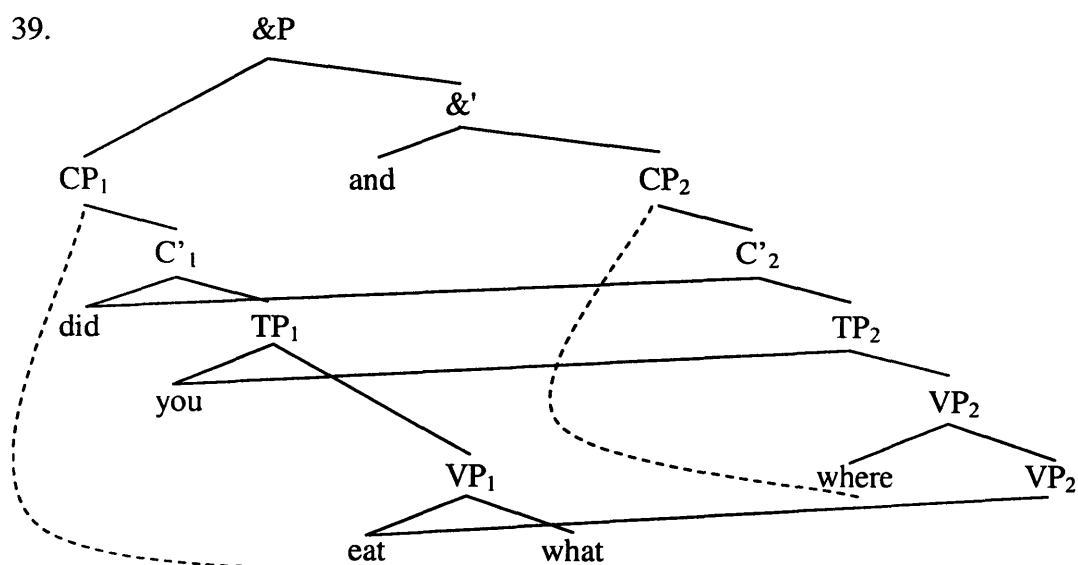
- Grammaticality contrasts between *Wh&Wh*'s that involve optionally versus obligatorily transitive verbs (section 2.1 for English, section 3.3 for Croatian),
- Interpretation of grammatical *Wh&Wh*'s (section 2.3 for English, section 3.2 for Croatian),
- Contrast between *Wh&Wh*'s containing subject versus object depictives (section 2.2 for English, section 3.4 for Croatian),
- Clitic repetition (in Croatian, section 3.1),
- Ungrammaticality (in English) of *Wh&Wh*'s that contain a *wh*-subject (section 2.4),
- Preposition stranding in English (section 2.5).

Now that we have established that *Wh&Wh*'s in Croatian *may* and in English *must* be derived from a representation involving CP-coordination, our next task is to explain their surface representation, i.e. to see how to derive the surface string in which the identical part of the two CPs is pronounced only once.

5. Analysis

The analysis proposed here is that in a BMW, the two conjuncts share all of the terminal nodes in the sentence, except the wh-phrases. The structure I propose for a BMW in (38) is repeated below from (3).

38. What and where did you eat?



Let us first take a look at how the proposed structure in (39) accounts for the properties of BMWs that I presented in sections 2 and 3.

5.1. Properties of a BMW explained

The structure of a BMW in (39) straightforwardly derives two observed characteristics of a BMW. First, it derives the contrast in grammaticality between BMWs with optionally transitive verbs and those with obligatorily transitive verbs. Next, it derives the fact that a BMW only has the *at-all*-reading of the second conjunct, while the *it*-reading is absent. Let us examine each of these results in turn.

According to (39), the verb in a BMW is shared between the conjuncts. This means that whatever subcategorization requirements the verb has, they have to be met in both conjuncts. If the verb *obligatorily* requires an object, this requirement must be satisfied both in the *what*-clause (first conjunct) and in the *why*-clause (second conjunct). However, since the proposal is that the direct object, *what* is absent from the second conjunct, it follows that in this conjunct the subcategorization requirements of the verb are satisfied only if the verb can also surface *without* a direct object. This is the case with verbs such as *eat*, *sing*, *read*, *teach*, etc., but not with verbs like *buy*, *fix*, *devour*, *hit*, etc. The contrast in (6), repeated here as (40) is therefore accounted for.

40. a. What and where did you sing?
b. *What and where did you buy?

The fact that a BMW only has the *at-all*-reading also directly follows from the structure in (39). Given that the direct object is absent from the syntactic structure of the second conjunct, it cannot be interpreted in the second conjunct. This rules out the *it*-reading. We have an explanation for why the question in (41) only has the meaning in (42)a. The examples are repeated from (12) and (13) in section 2.3.

41. What and why did you eat?

42. a. What did you eat and why did you eat at all?

b. #What did you eat and why did you eat it?

What about the other relevant properties of BMWs:

- the contrast between a BMW with a subject depictive and one with an object depictive,
- the impossibility of having the subject as one of the wh-phrases in a BMW, and
- the fact that preposition stranding in a BMW is bad in English, even though the language otherwise allows it?

I argue that these also fall out from the structure in (39). However, in order to see that this is indeed so, we first need to know more about the ways in which the structures that contain non-bulk shared material are constrained.

5.1.1. COSH

As I already mentioned in Chapter 1, I argue that the grammar allows non-bulk shared structures, such as (39), but only under special circumstances. In particular, I argue that sharing is constrained by COSH. COSH is repeated from Chapter 1 in (43) below.

43. *Constraint on Sharing (COSH)*

For any α , M, and N,

where $M \neq N$, and

- i M and N immediately share α , and
- ii M and N horizontally share α , and
- iii there is no node K that vertically shares α with both M and N

For any terminal node β , M completely dominates β iff N completely dominates β .

The definitions of *immediately share* and *completely dominate* are repeated in (44) and (45) below.

44. *Immediately share*

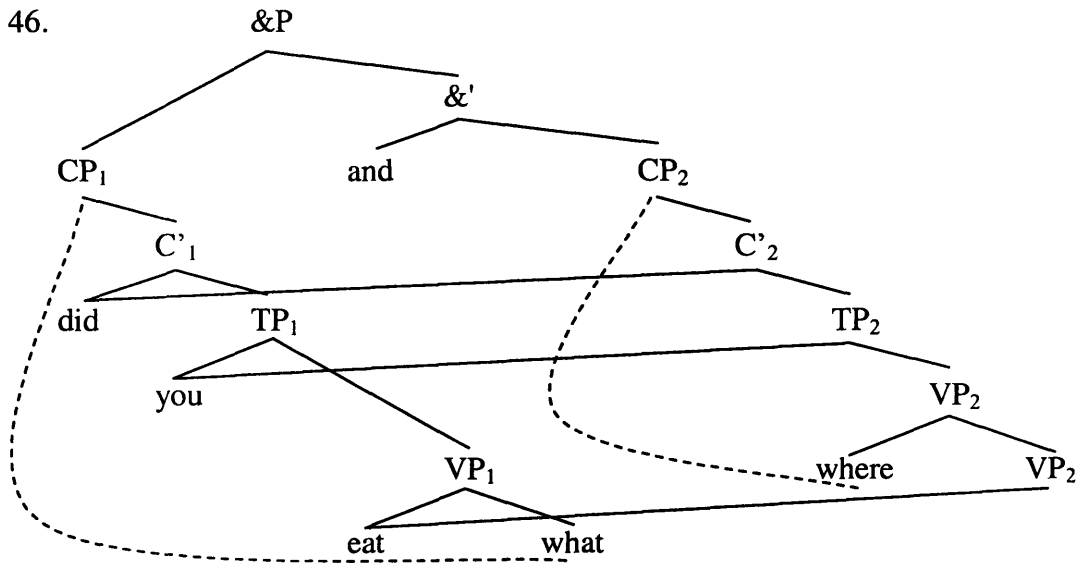
X and Y *immediately share* α if $X \neq Y$, and X is a mother of α and Y is a mother of α .

45. *Complete dominance*

α completely dominates β if every path from β upwards to the root includes α .

(Fox & Pesetsky, in preparation)

Let us examine the structure in (39), repeated here as (46) with respect to COSH.



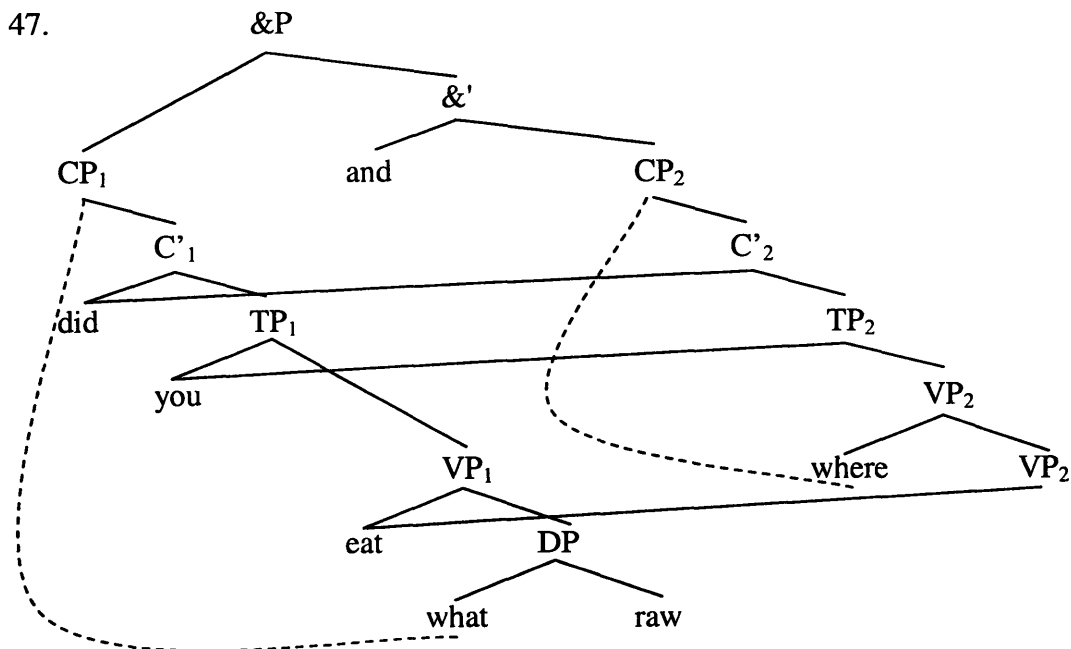
The shared nodes, *did*, *you* and *eat* have multiple mothers, one in each conjunct. However, none has a mother that dominates all its mothers. Next, we need to look at what the mothers of each shared node completely dominate. The two VPs completely dominate nothing, since the verb, *eat* is shared, and the wh-object, *what* has moved out of VP₁, so that VP₁ no longer completely dominates it. The same is true of the two TPs: neither of the TPs completely dominates *you* or *eat*, since both these nodes are also dominated by the TP in the other conjunct. In addition, TP₁ does not completely dominate *what*, because it has moved out to the [Spec, CP] of the first conjunct, and TP₂ does not completely dominate *where*, since it too has been remerged to a position higher than the TP₂ ([Spec, CP] of the second conjunct). The same reasoning applies to the two C' projections. So, for each shared node, there is nothing that is completely dominated by one of its mothers that is not completely dominated by the other. Thus, (46) satisfies COSH.

With this much in mind, let us return to the question of how (46) derives the remaining properties of a BMW: the contrast between a subject vs. object depictive, the ban on wh-subject and the ban on preposition stranding in a BMW.

5.1.2. COSH In Action

First, let us look at the contrast in depictives. For a depictive to be grammatical in a sentence, the sentence must contain a phrase that provides an argument for the depictive. In the case of a subject depictive, the relevant phrase is the subject; and for the object depictive, it is the object. If (46) is correct, the second conjunct in a BMW does not contain the object wh-phrase. Therefore the second conjunct cannot contain an object depictive. On the other hand, a subject depictive is allowed, since both conjuncts have a (shared) subject.

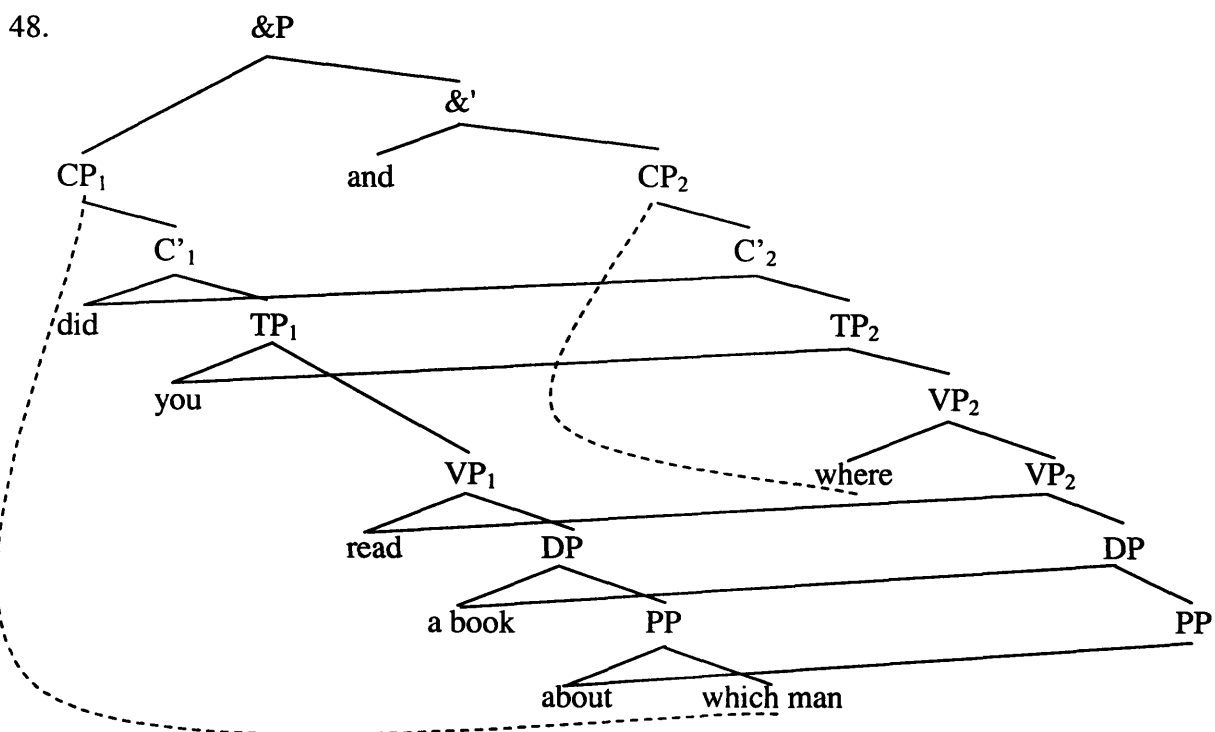
The reader might ask why it is not possible to have an object depictive merged in the first conjunct *only*, without its being shared by the second conjunct, as in (47).



The reason why (47) is ruled out is that it does not satisfy COSH. The multiple mothers of the shared verb *eat*, VP₁ and VP₂ do not completely dominate identical sets of terminal nodes. While VP₁ completely dominates the depictive, *raw*, VP₂ does not. This is a violation of COSH. Given

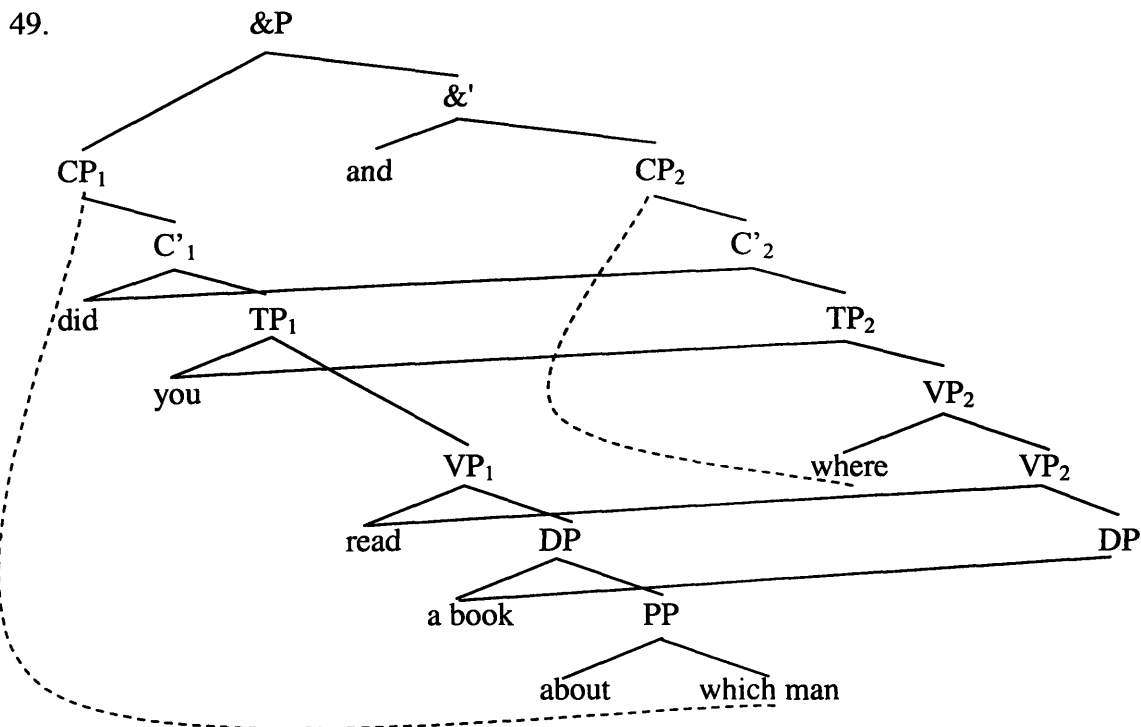
the transitivity of (complete) dominance, the same violation is incurred by multiple mothers of other shared nodes, *you* and *did*. Thus, even though in (47) the depictive would have a proper host, the structure is not legitimate.

The same reasoning applies when we look at how the structure in (46) explains the ban on preposition stranding in an English BMW. If the wh-object in the first conjunct moves to [Spec, CP₁] stranding a preposition behind, the structure only satisfies COSH if the preposition is shared between the conjuncts, as in (48). However, since the wh-object is absent from the second conjunct, the subcategorization requirements of the preposition in that conjunct are not met, and the sentence is ruled out.



If, on the other hand, the preposition is not shared, but is merged and interpreted only in the first conjunct, as in (49), the structure is ruled out by COSH, since in the first conjunct, the mothers of

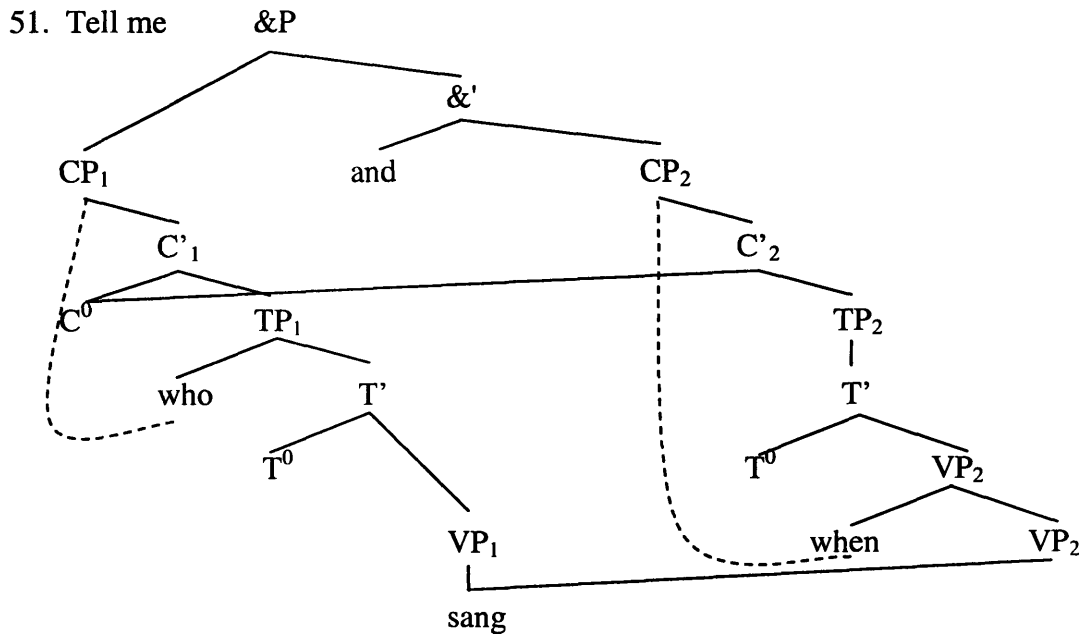
the shared nodes, *a book*, *read*, *you* and *did* all completely dominate the preposition *about*, while their counterparts in the second conjunct do not, in violation of COSH.



Finally, let us see why the subject may not be one of the wh-phrases in a BMW. I have argued that a BMW is derived from a structure in which each of the conjuncts only contains one wh-phrase. The sentence in (50), where one of the wh-phrases is the subject, would have a representation in (51) (I only represent the relevant part of the structure).³¹

50. *Tell me who and when sang?

³¹ In (51) I represent T^0 heads as not being shared. However, I think the same result would obtain if we assume that T^0 is shared.

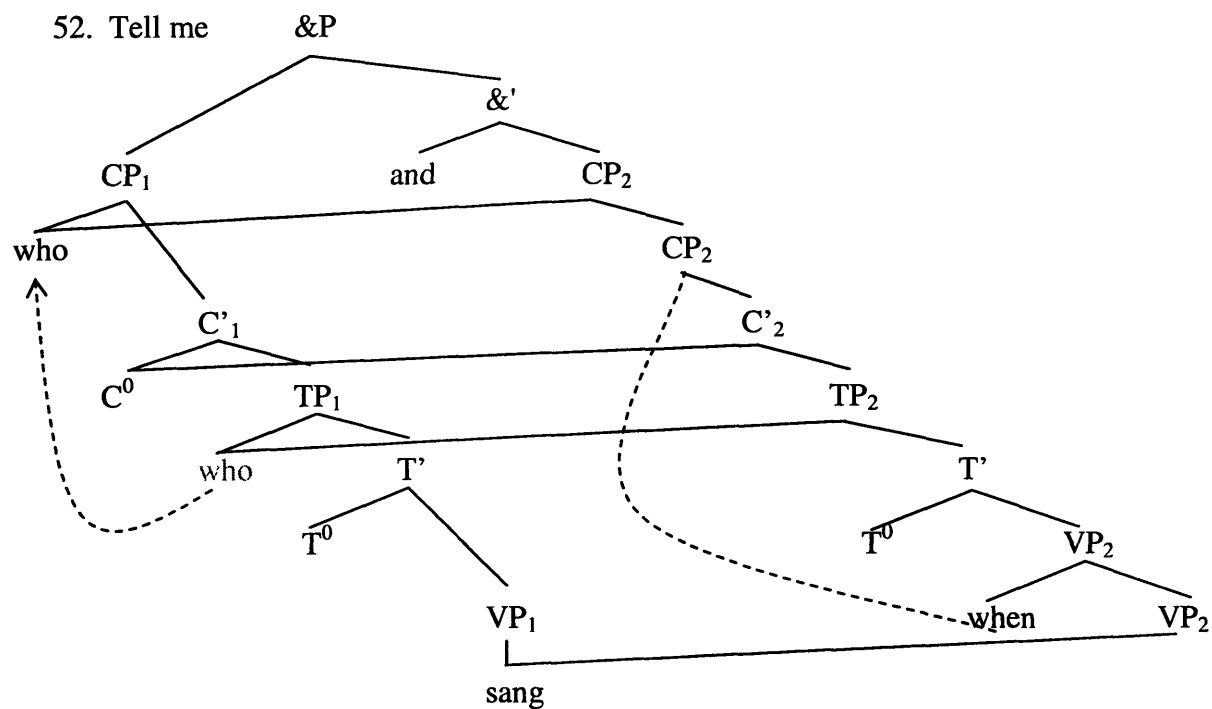


In (51), the second conjunct does not contain a subject, which rules the sentence out.

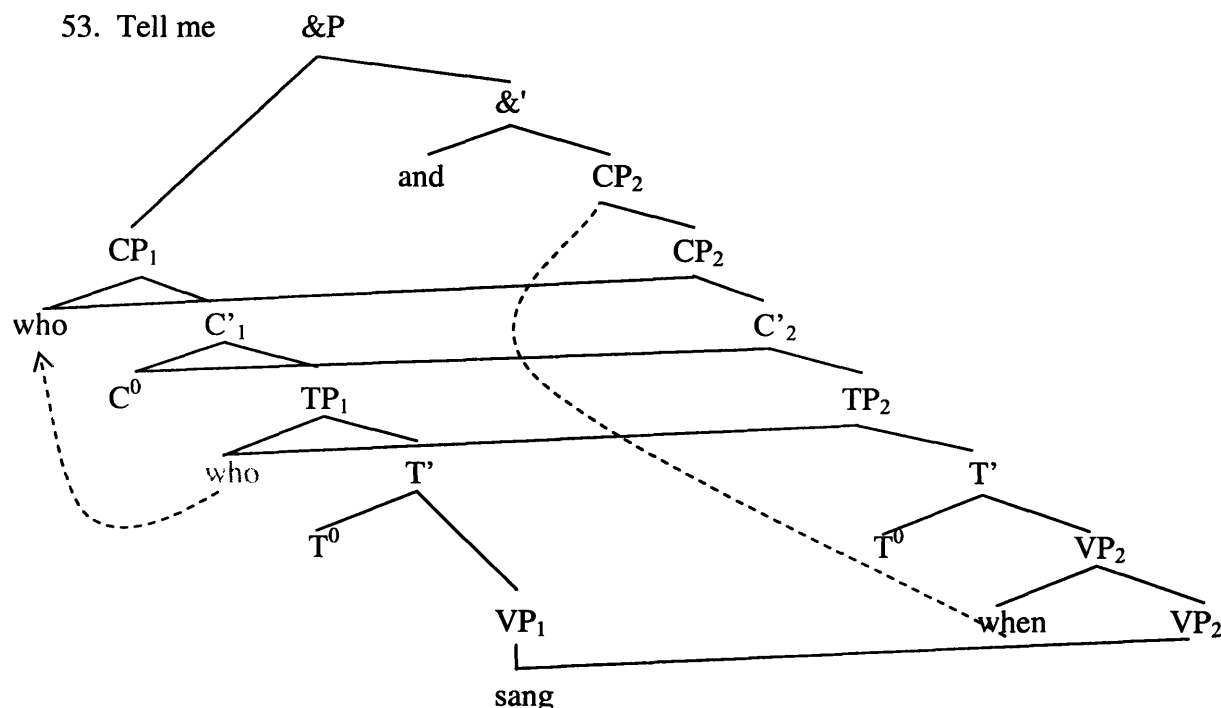
We might ask at this point whether it is possible for the subject phrase, *who* to be shared between the two conjuncts. The answer to this question is no. As far as I can tell, there are three possible outcomes of sharing the *wh*-subject phrase, *who* between the two conjuncts, and all of them are problematic. Let us note first that in all three scenarios outlined below, all terminals in the first conjunct are shared. In other words, the first conjunct is “contained” in the second one. This situation might be more generally disallowed by some principle of economy. Assuming for a moment that it is allowed, let us go through the possible scenarios in which *who* is shared.

First, we might suppose that *who* is shared and that it moves to [Spec, CP] in both conjuncts, as illustrated in (52). There are two independent reasons for which this outcome is problematic. First, COSH is violated, since the mother of *who* in the second conjunct, CP₂ completely dominates *when* (since the site where *when* is remerged is completely dominated by

CP₂), while the mother of *who* in the first conjunct, CP₁ does not. In addition, the second conjunct contains two fronted wh-phrases, which is independently disallowed in the language.



Another scenario one might imagine if *who* were shared is that it is remerged as a lower specifier of CP₂. This is shown in (53).



Structure in (53) satisfies COSH, but there still remains the problem of multiple wh-movement, just as we saw in the case in (52) above.^{32,33}

³² In this scenario, the multiple wh-movement would also violate Superiority.

³³ This seems to predict that (53) is allowed in a language that allows multiple wh-movement and superiority violations (if the fact that the first conjunct is “contained” in the second turns out not to be problematic). I have not yet tested that prediction. A good language to test it would be a language that is not *pro*-drop, so as to rule out a possible representation in which the second conjunct is a single wh-question containing an unshared *pro* subject, as in (i). We already saw this possibility in (37).

- (i) Tell me [who_i sang] and [when *pro*_i sang].

The obligatory coreference of *pro* and *who* in (i) may be explained by the requirement that unshared material that contrasts with material in the other conjunct bear stress. Since *pro* cannot bear stress, it may not be contrastive. See section 6.2.2. of this chapter for relevant discussion.

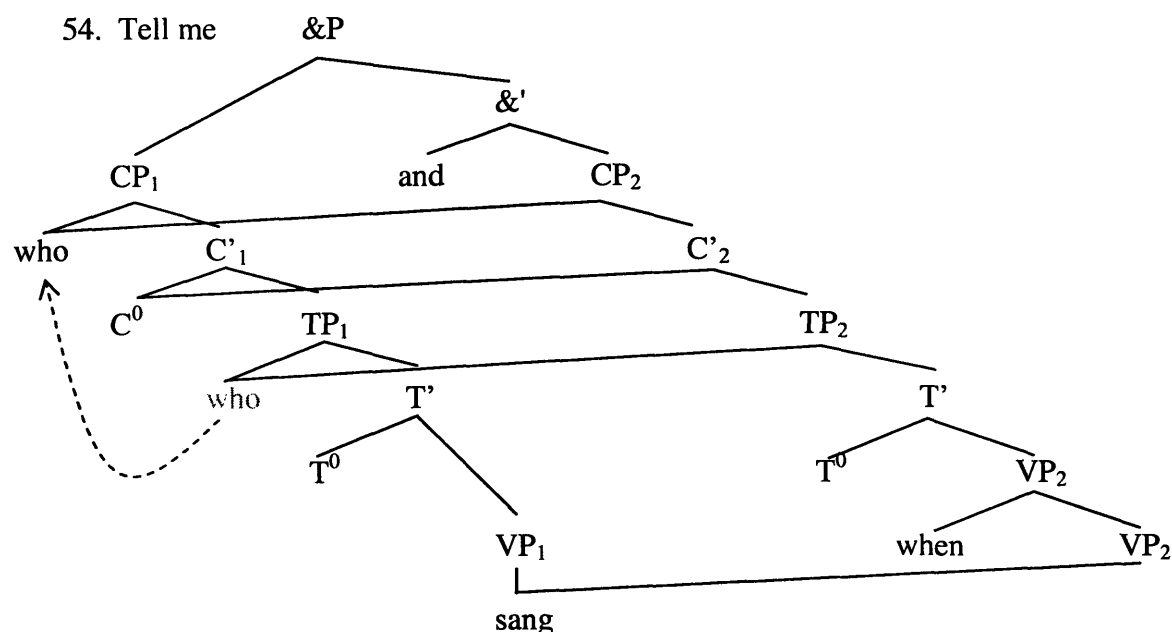
A related question arises: given the grammaticality of (i), why is (ii) ungrammatical in English?

- (ii) *Tell me who and when Mary/she sang?

The Croatian counterpart of the sentence in (ii), with an overt pronoun or DP, is also degraded. This might be due to the Avoid Pronoun Principle, according to which the use of *pro* is favored to the overt pronoun whenever possible (Jaeggli, 1982). It seems that both in English and Croatian examples with a more complex conjunction, such as *let alone* or *much less*, improve if the subject of the second conjunct is a phrase such as *that person*, or *he in particular*, that forces the identity of reference with the subject of the first conjunct, *who*.

- (iii) 'I have no idea who much less why that person sang yesterday afternoon.

Finally, we might imagine a situation in which *who* is shared, and *when* does not move to a specifier position of CP₂. This possibility is represented in (54). Here, there would be no issue concerning multiple wh-movement, but we would again have a violation of COSH. The mother of *who* in the second conjunct, CP₂ would again end up completely dominating *when*, while CP₁ would not.



Thus, COSH, in conjunction with the independent principles that govern wh-movement in English successfully rules out a representation of (50) in which the subject wh-phrase is shared between the conjuncts.

In this section we saw how the structure I proposed for a BMW, given in (39)/(46), explains the properties of that construction, which we saw in sections 2 and 3 of the chapter. The

At the moment, it is not clear to me why these contrasts obtain. I leave these questions for further research.

proposed structure straightforwardly accounts for the fact that a BMW is only grammatical with an optionally transitive verb, and that it only has the *at-all*-reading. It also explains the fact that a BMW may contain a subject depictive, but not an object depictive, the fact that a BMW may not contain a wh-subject and the fact that preposition stranding is not permitted in a BMW. We noted that these properties would not hold if it were possible for the first conjunct alone to contain an object depictive and the stranded preposition, and if the wh-subject in the first conjunct were also part of the second. However, we saw that these possibilities are not allowed, due to the condition on sharing, COSH, which governs circumstances under which a sharing structure is well-formed.

5.2. More COSH Action

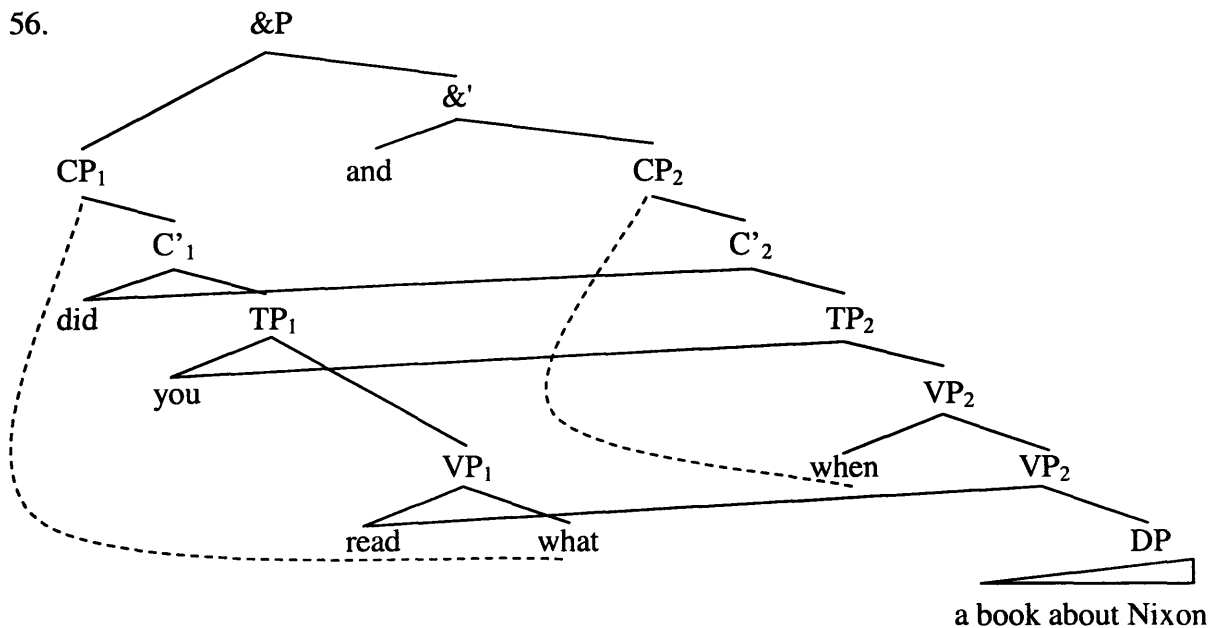
In the previous section we saw how COSH rules out those instances of BMWs in which some unshared material (a depictive or a preposition) appears in the first conjunct, but not in the second. Before we attempt to derive COSH from more basic principles of grammar, let us take a look what happens if a BMW contains material in the second conjunct that is not shared by the first. Consider the sentence in (55)a, and the unattested reading in (55)b that we might think is predicted by the non-bulk sharing hypothesis.

55. a. *What and when did you read a book about Nixon?

b. #What did you read and when did you read a book about Nixon?

Without COSH, (56) would be a possible structure of (55)a. In fact, however, (56) does not satisfy COSH. This is because the set of terminal nodes completely dominated by VP_1 is not

identical to the set of terminal nodes completely dominated by VP₂. While VP₁ completely dominates nothing, VP₂ completely dominates the DP, *a book about Nixon*. The unshared DP in the second conjunct, *a book about Nixon*, is completely dominated not only by VP₂, but also by TP₂ and C'₂. Thus, considering other shared nodes, namely *did* or *you*, also yields a violation of COSH.

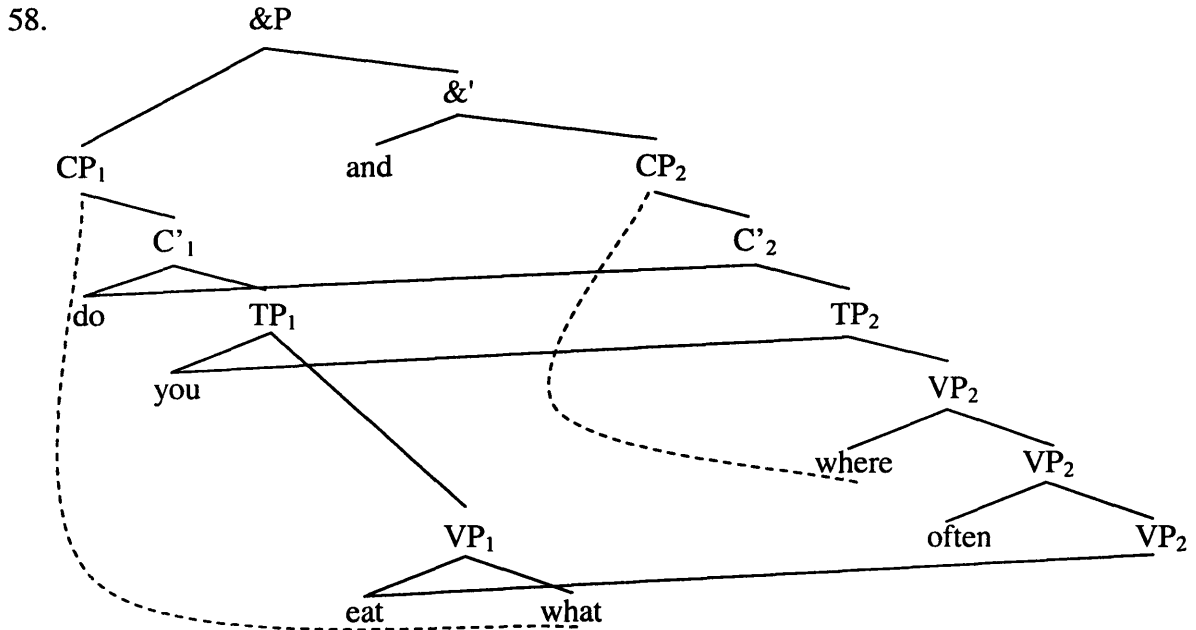


A similar result obtains if we take a look at the sentence in (57)a, where the non shared material, *often*, is sandwiched between the shared material in the second conjunct. The sentence does not have the reading in (57)b. In other words, the adverb, *often* is necessarily interpreted in both conjuncts.

57. a. What and where do you often eat?

b. #What do you eat and where do you often eat?

The structure that would result in the reading in (57)b is shown in (58). By now it is easy to see that (58) is ruled out by COSH for the same reasons for which (56) is inadmissible. Namely, the mothers of the shared nodes, *you* and *did* in the second conjunct (TP₂ and C'₂) completely dominate the adverb, *often*, while their counterparts in the first conjunct, TP₁ and C'₁ do not.



Thus, COSH seems to be able to filter out the representations that involve non-bulk sharing which produces an ungrammatical sentence, as was the case with (55), or results in a reading that seems to be absent, as we saw was the case with (57). On the other hand, it allows those instances of non-bulk sharing that speakers judge as grammatical, namely BMWs. I take this to be evidence that COSH accurately describes the distribution of sharing.

6. When More Goes Unshared

Recall that COSH is formulated so that it looks at the sets of terminal nodes completely dominated by the mothers of a shared node and checks whether those sets are identical. If they are not, COSH rules the structure out. Note, however, that COSH has nothing to say about the sets of terminal nodes completely dominated by the mother of *an unshared node*. Thus, while COSH rules out a representation in which there is any unshared material lower in the structure than the shared material, the opposite is not the case.³⁴ So far, we have seen that the unshared wh-phrases in a BMW, once they move to the [Spec, CP] in their respective conjuncts, indeed do appear higher than all the shared material. In this section we will see that unshared material other than wh-phrases may appear in the structure, as long as it is not lower than the shared material. In fact, this is the case in Croatian BMWs, where besides wh-phrases clitics are also unshared, since they are pronounced twice, once after each wh-phrase. The shared material that may appear in the structure c-commanding shared material is, however, not limited to wh-phrases and clitics. A BMW may contain two coordinated CPs in which subjects are also unshared. In the following section I examine these.

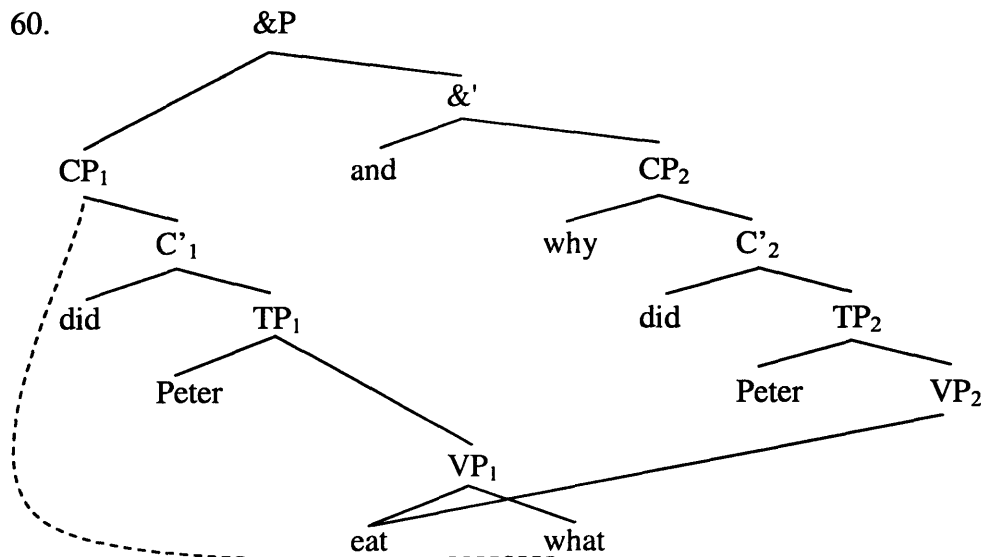
6.1. A BMW with Unshared Subjects

Conjuncts in a BMW do not necessarily have to share subjects (or auxiliaries). If the subjects in the two coordinated CPs are not shared, they are pronounced twice. The two subjects may have the same referent, as in (59)a, or they may have distinct referents, as in (59)b.

³⁴ I am using the vague term ‘lower in the structure’ in order to refer to the position of a node Y that is not c-commanded by a shared node X, but would be if X were not shared.

59. a. What did Peter and why did Peter eat?
 b. What did Peter and why did Mary teach?

The sentence in (59)a has the structure in (60).³⁵



Structure (60) is not ruled out by COSH. The only shared node, the verb *eat*, has two mothers, VP₁ and VP₂, and neither of them completely dominates any terminal nodes.

COSH thus correctly predicts that there is an asymmetry between shared and unshared material in that shared material may appear lower in the structure than shared material, but that the converse is not the case. Given this asymmetry, we predict that a language where subjects in a wh-question are postverbal does not have BMWs with unshared subjects. A postverbal subject is presumably hierarchically lower than the verb, and in a situation where the verb is shared, this

³⁵ Here, I follow the proposal by Ko (2005), that *why* is merged directly in [Spec, CP], but nothing hinges on this choice.

would result in a COSH violation. This prediction is borne out in Greek, which possesses BMWs, but only if the subject is shared between the conjuncts.³⁶

61. Ti ke pu tragudise i Maria? ✓ *A Greek BMW with shared subjects*
 What and where sang the Maria
 ‘What and where did Maria sing?’

62. a. *Ti o Petros ke pu i Maria tragudise? ✗ *A Greek BMW with*
 What the Petros and where the Maria sang *unshared subjects*
 ‘What did Petros and where did Maria sing?’

b. *Ti o Petros ke pu tragudise i Maria?
 What the Petros and where sang the Maria

The existence of the contrast between (61) and (62) may seem to the reader to be problematic for the analysis proposed here. It is in fact not so. On the contrary, the contrast will be shown to actually give support to the analysis. In particular, we will see that the proposal of non-bulk sharing in conjunction with COSH and independent principles observed in Greek correctly predicts (61) to be grammatical, while both (62)a and (62)b are predicted to be ungrammatical. Let us examine the Greek examples in more detail. We first note that in the

³⁶ That (61) is indeed a BMW is supported by the fact that it becomes bad with an obligatorily transitive verb, as (i) shows:

(i) *Ti ke pu eftiakse o Petros?
 What and when fixed the Peter
 ‘What and when did Peter fix?’

grammatical BMW in (61), the subject and the verb appear in an inverted order. This is an instance of the obligatory subject-verb inversion in Greek, exemplified in (63).³⁷

63. a. I maria aghapai ton ilia.

the Maria.NOM love.3SG the Ilias.ACC

‘Maria loves Ilias.’

b. Pjon aghapai i maria?

who.ACC love.3SG the Maria.NOM

‘Who does Maria love?’

c. *Pjon i maria aghapai?

who.ACC the Maria.NOM love.3SG

Examples from Kotzoglou (2006)

Thus, we expect that a BMW in which there is no subject-verb inversion should be bad, independent of whether the subjects are shared or not. This is indeed the case, as shown by (64).

64. *Ti ke pu i Maria tragudise?

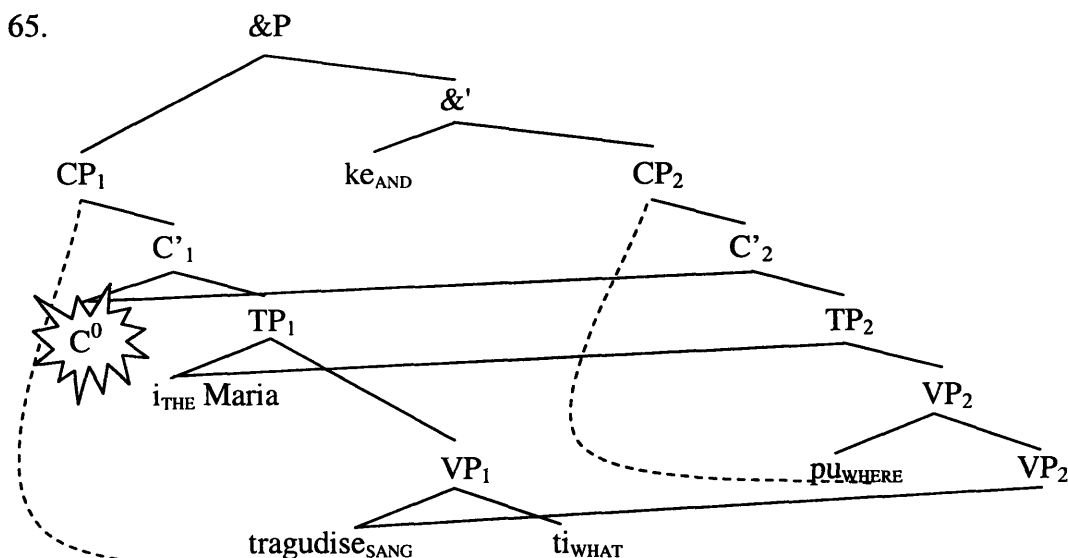
What and where the Maria sang

The structure of the ungrammatical (64) is presumably the one in (65).³⁸ The reason why (64) is ill-formed is independent of sharing or COSH. Assuming that it is a feature of C^0 that drives V/T-to-C movement (Baker (1970), Radford (1997), Roberts & Roussou (2002)),

³⁷ I assume here that the subject-verb inversion is a consequence of T-to-C movement. However, the argument presented here still holds if the verb in wh-questions is in T^0 and the subject remains in [Spec, VP] (Anagnostopoulou, 1994).

³⁸ In (65) I represent C^0 as shared, but it may well be that each CP has an independent head.

whatever this feature is, in (65) it is not satisfied.³⁹ The sentence is out on the grounds that there is a feature on a functional head, C^0 that is not checked by the time the structure is shipped off to the interfaces.



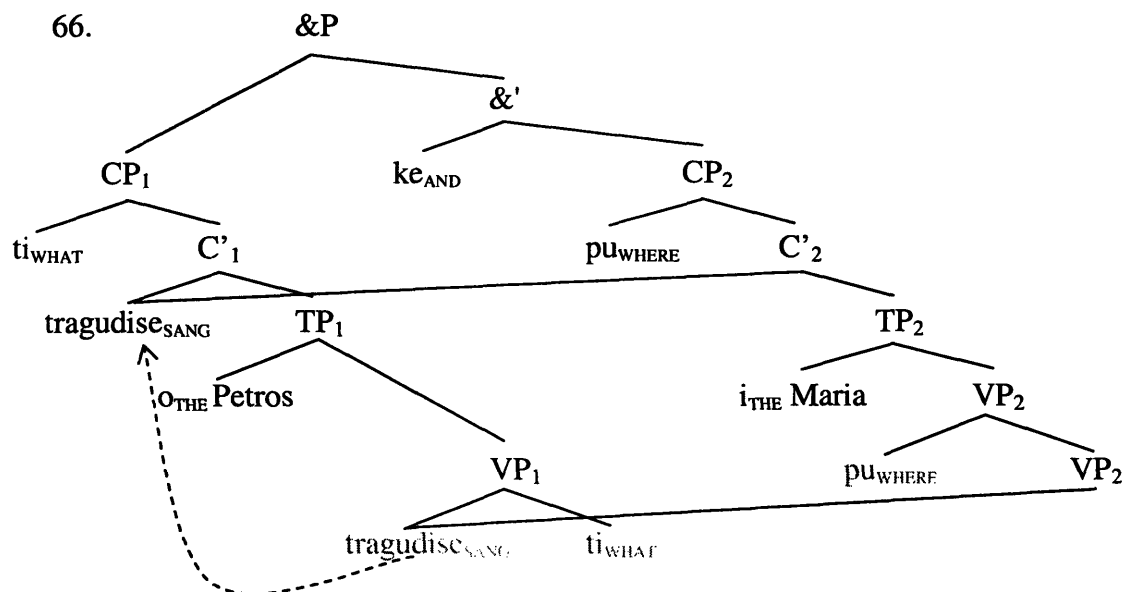
Let us now turn to a BMW with unshared subjects. As far as I can tell, there are several possibilities to consider, depending on (i) whether the complementizer is shared, and (ii) if it is not, which C^0 the shared verb ends up moving to. The space of logical possibilities is given in Table 5.

Table 5: Greek BMW with unshared subjects

Shared C^0		Independent C^0 's		
a. Verb in C^0	b. Verb <i>in situ</i>	c. Verb in C^0_1	d. Verb in C^0_2	e. Verb <i>in situ</i>

³⁹ More precisely, in the cited works, C^0 dominates a bound morpheme Q, which needs an overt host. It is the need of Q to have a host that drives the verb movement to C^0 .

We will see that all the possibilities in Table 5 are predicted to be bad. Note first that all of the options except the one in the shaded box a. in Table 5 are irrelevant for our purposes, because under any of them, there is always a C^0 in the structure whose uninterpretable feature is not checked. However, if the two conjuncts share the complementizer and the verb moves to it (box a.) the problem of unchecked features does not arise. Thus, the sentence is not ruled out by independent principles. It is, however, ruled out by COSH. The structure corresponding to box a. is given in (66).⁴⁰



The two mothers of the moved verb, *tragudise* ('sang'), C'_1 and C'_2 in (66) end up completely dominating different sets of nodes: C'_1 completely dominates the subject of the first conjunct, *o Petros*, while C'_2 completely dominates the subject of the second conjunct, *i Maria*. Thus, COSH correctly rules (66) out.⁴¹

⁴⁰ For reasons of clarity, I represent remerged elements as copies.

⁴¹ The prediction, however, is that a BMW in (i), where the subject is shared and the verb is not, and so the subject-verb inversion is not an issue, should be well-formed. This prediction is borne out.

We have now seen that more than just wh-phrases may go unshared in a BMW. More precisely, a BMW may contain unshared subjects. However, we saw that this is not universally allowed. In particular, we saw that English allows such BMWs, while Greek does not. I showed that this difference should be attributed to language-specific principles, in particular to the requirement for obligatory inversion between the subject and the main verb, which is operative in Greek but not in English. We saw that the inversion requirement interacts with non-bulk sharing and COSH in a way that makes correct predictions about which structures are admissible in the language and which are not.

I now turn to Croatian, which, like English, allows BMWs where more than wh-phrases goes unshared. We already saw, in section 3, that Croatian BMWs contain unshared clitics. We will now see that in a Croatian BMW, subjects may also go unshared. However, there is a puzzling difference between the unshared subjects and unshared clitics: while subjects may freely differ between the CPs, this is generally not so for clitics; unshared clitics in a Croatian BMW must be identical. In the next section I argue that the ‘identity requirement’ on clitics is an illusion, brought about by an interplay of factors that are independent of the properties of a BMW.

6.2. ‘Clitic Identity’ Puzzle in a Croatian BMW

In section 3 I argued that clitic repetition is a hallmark of a BMW in Croatian. The fact that clitics are pronounced twice, as in (67), is an indication that they are not shared between the conjuncts.

-
- (i) Ti tragudise ke yiati eklapse o Petros?
 What sang and why creid the Peter
 ‘What did Peter sing and why did Peter cry?’

67. Što MU JE i gdje MU JE Petar pjevao?

What him.CL *Aux*.CL and where him.CL *Aux*.CL Petar sang

‘What and where did Petar sing to him?’

Croatian patterns with English in that it also allows the subject in the two coordinated CPs to be unshared. The two unshared subjects may refer to the same individual(s) or to different ones, as we saw was the case in English. This is shown in (68).

68. a. Što MU JE Dan i gdje MU JE Dan pjevao?

What him.CL *Aux*.CL DAN and where him.CL *Aux*.CL Dan sang

‘What and where did Dan sing to him?’

b. Što MU JE Dan i gdje MU JE Vid pjevao?

What him.CL *Aux*.CL DAN and where him.CL *Aux*.CL Vid sang

‘What did Dan and where did Vid sing to him?’

The BMWs in (68) are grammatical for the same reasons for which English BMWs in (59) are: they obey COSH. What we might find suspect is the fact that the grammatical BMW with different subjects in (68)b contrasts with the ungrammatical examples in (69) below, where the clitics in the two conjuncts are not the same. This is independent of whether the subjects are shared or not, and if they are not, whether they have the same or different referents.

69. a. *Što MU JE i zašto JOJ JE Vid pjevao?

What him.CL *Aux*.CL and why her.CL *Aux*.CL Vid sung

‘What did Vid sing to him and why did Vid sing to her?’

b. *Što MU JE Dan i zašto JOJ JE Dan pjevao?

What him.CL *Aux*.CL Dan and why her.CL *Aux*.CL Dan sung

‘What did Dan sing to him and why did Dan sing to her?’

c. *Što MU JE Dan i zašto ĆE JOJ Vid pjevati?

What him.CL *Aux*.CL Dan and why *Aux*.CL her.CL Vid sing

‘What did Dan sing to him and why will Vid sing to her?’

Judging by the contrast between (68)b and (69), it appears that clitics, unlike the rest of the unshared material, are subject to a condition that requires them to be identical in both conjuncts. I propose that this is not the case. In fact, I argue that there is no such thing as an ‘identity requirement’ on clitics. Rather, various other factors conspire to produce this effect. It turns out that these factors are not the same for auxiliary clitics and for pronominal clitics. Let us first take a look at what forces the identity of auxiliary clitics. I return to pronominal clitics in section 6.2.2.

6.2.1. Identity of Auxiliary Clitics

In this section I argue that identity requirement on auxiliary clitics in a Croatian BMW can be reduced to the fact that the shared verb in a BMW must bear morphology that is compatible with the unshared auxiliary in each conjunct.

Consider the following ungrammatical BMW, where both conjuncts contain identical pronominal clitic, but different auxiliary clitics.

70. *Što SI MU i zašto ĆEŠ MU pjevati?

What *Aux.CL* him.CL and why *Fut.CL* him.CL sing

‘What did you sing to him and why will you sing to him?’

Based on the ungrammaticality of (70), where the first conjunct is in the past tense, and the second in the future, it appears that auxiliary clitics in a Croatian CMW must have the same tense. However, I would like to propose that the badness of (70) is not due to different tense features, but to the fact that in the past tense the verb appears in the participle form, while in the future it appears in the infinitive. Participle and infinitive have different forms in Croatian; the participle ends in *-l* (*-o* in masculine singular), while the infinitive ends in *-ti/-ći*. Since, under the present proposal, the verb is shared between the conjuncts, it is not surprising that it must have the same form. The only construction besides past tense in which the auxiliary is a second position clitic, and the verb appears in the participle form is the conditional. Thus, we might expect examples like (71) to be grammatical, contrary to fact.

71. *Što SI MU i zašto BI MU pjevao?

What *Past.cl* him.cl and why *Cond.cl* him.cl sung

‘What did you and why would you sing to him?’

It seems to me that the badness of (71) is due to pragmatic reasons. This is because (72), which is one of the underlying conjuncts in (71), presupposes that you did not sing to him. It is then contradictory to ask what you did sing to him.⁴²

72. Zašto BI MU pjevao?

Why *Cond.cl* him.cl sung

‘Why would you sing to him?’

The BMW in (73), however, is correctly predicted to be well-formed, since in this sentence, the subjects are not shared, and the presupposition that Peter did not sing anything does not clash with the question what Dan *did* sing to him.

73. Što MU JE Dan i zašto BI MU Petar pjevao?

What him.cl *Past.cl* Dan and why *Cond.cl* him.cl Petar sung

‘What did Dan and why would Peter sing to him?’

⁴² The English translation in (72) is misleading, since its use in the discourse below is felicitous.

- (i) A: I just ate a raw snail.
B: Ewww! Why would you do it?

In Croatian, B’s utterance in (i) is infelicitous in the context. Instead, a Croatian speaker would say something like (ii).

- (ii) a. Zašto si to napravio?
Why *Aux.2.S.* that done
‘Why did you do it?’
b. Što ti je došlo da to napraviš?
What you.DAT *Aux.3.S.* come that this do.2.S.
‘What came over you to do it?’

The sentence in (74), where each embedded question is attributed to a different subject, is also good, since the presupposition built into Marija's question, that I did not sing to him, does not clash with Ivan's question that presupposes that I did sing to him.

74. Ivan me pitao i Marija me pitala što SI MU

Ivan me.cl asked and Marija me.cl asked what *Past.cl* him.cl

i zašto BI MU pjevao?

and why *Cond.cl* him.cl sung

'Ivan asked me and Mary asked me what did you and why would you sing to him?'

Auxiliary clitics may, however, bear different person morphology, provided that the subjects are of such person-number combinations that the participles, once they agree with the subjects, end up having the same form. This is illustrated in (75).⁴³ If subjects of both conjuncts are masculine, as in (75)a, the form of the participle required by both is *hvalio* ('praised'). The sentence is well formed, even though the auxiliary clitic in the first conjunct is third person, and in the second it is second person singular. Similarly, in the grammatical (75)b, the feminine singular subject of the first conjunct, *Anja*, and the neuter plural subject of the second conjunct, *djeca* ('children'), both require the same form of the participle, *hvalila* ('praised'). In (75)c, the

⁴³ If auxiliary clitics differ in person between the conjuncts, the subjects (which then by definition also differ) cannot be *pro*-dropped. Thus, a sentence in (i) is ungrammatical:

- (i) *Kada ga je *pro* i gdje si ga *pro* hvalio?
 When him.CL *Past.CL pro* and where *Past.CL* him.CL *pro* praised
 'When did he and where did you praise him?'

This is expected, since neither the clitics nor the *pro* can bear stress, and we will see that the contrasting unshared material must be stressed. Overt subjects are thus necessary in order to bear stress.

masculine subject of the first conjunct, *Petar* requires the participle to have masculine morphology, *hvalio*, whereas the feminine subject of the second conjunct, *Marija*, requires the feminine morphology on the participle, *hvalila*. Since the two requirements are incompatible, the sentence is out. The same is true of (75)d, where the masculine singular participle, *hvalio*, required by *Petar*, differs from the masculine plural participle, *hvalili*, required by the plural subject of the second conjunct, *dječaci* ('boys').

75. a. Kada GA JE Petar i gdje SI GA ti hvalio?

When him.CL Aux.3.M.SG Petar and where Aux.2. SG him.CL you praised.M.SG

'When did Petar and where did you praise him?'

b. Kada GA JE Anja i

When him.CL Aux.3.M.SG Anja and

gdje SU GA djeca hvalila?

where Aux.3.N.PL him.CL children praised.F.PL/N.PL

'When did Anja and where did the children praise him?'

c. *Kada GA JE Petar i

When him.CL Aux. 3.M.SG Petar and

gdje GA JE Marija hvalila?

where him.CL Aux. 3.F.SG Marija praised.F.SG

'When did Petar and where did Marija praise him?'

d. *Kada GA JE Petar i
 When him.CL *Aux.* 3.M.SG Petar and
 gdje SU GA dječaci hvalili?
 where *Aux.* 3.M.PL him.CL boys praised.M.PL
 ‘When did Petar and where did the boys praise him?’

Thus, if I am right, auxiliary clitics do not have to be the same at all – they can differ in person, and they might in principle differ in gender, number and tense, as long as it does not cause problems for morphology and pragmatics.

Let us now see what this means for the clitics in a BMW where only wh-phrases and the clitics are unshared. Crucially, the two clauses in such a BMW share the subject. The same subject automatically means the same person and number on the auxiliary clitic. Given that only past and future tenses use second position clitic auxiliaries, and these two tenses display different morphological endings on the main verb, a grammatical BMW must have auxiliary clitics of the same tense. It then follows that grammatical BMWs have identical auxiliary clitics.

In this section I showed that the apparent “identity requirement” on auxiliary clitics in Croatian BMWs is not real. We saw that other factors, morphological and pragmatic, conspire to produce the effects that fool us into believing that such a requirement exists. In the next section, we will see that there is no “identity requirement” on pronominal clitics either. However, reasons that create an appearance that such a requirement exists are distinct from the ones that are at work in the case of auxiliary clitics.

6.2.2. Identity of Pronominal Clitics

We saw in (69)a and (69)b above that a Croatian BMW is ungrammatical if the two conjuncts contain different pronominal clitics, even if the auxiliary clitics are the same. One important property of the pronominal clitics in (69)a and (69)b is that they necessarily have distinct referents (given that one is feminine and the other is masculine). In (76) below, I show that, while it is true that pronominal clitics may not have different referents, they actually may have different form.

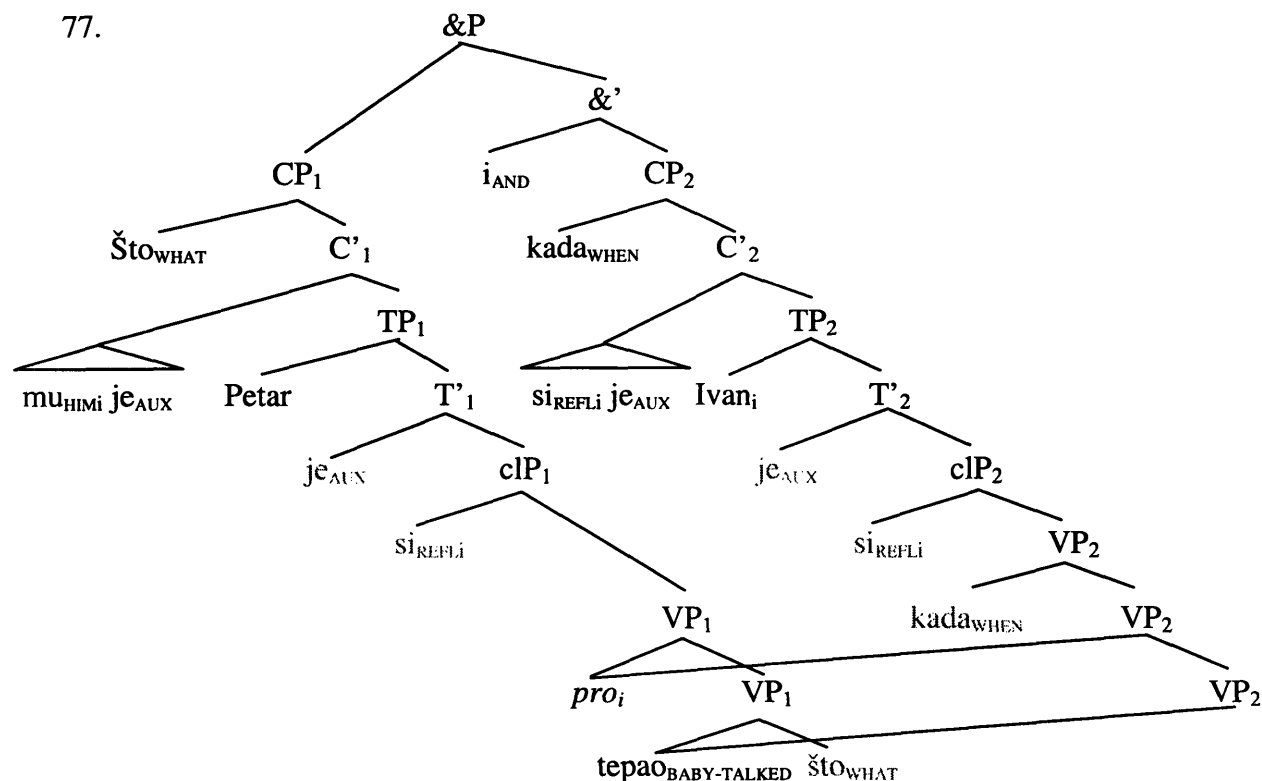
76. Što $MU_{i/*j}$ JE Petar_j i kada SI_i JE Ivan_i tepao?

What him.CL *Aux*.CL Petar and when refl.CL *Aux*.CL Ivan baby-talked

‘Why did Petar baby-talk to him_i and when did Ivan_i baby-talked to himself_i?’

It is important to emphasize the fact that (76) is only grammatical under the reading where the referent of the pronominal clitic in the first conjunct, *mu* (‘him’) is understood to be the same as the referent of the reflexive clitic in the second conjunct, *si* (‘oneself’). Thus, it seems that it is not quite correct to say that pronominal clitics in the two conjuncts in a BMW must be identical. Rather, the generalization seems to be that pronominal clitics may differ in form, as long as they are identical in reference. However, even if the “identity requirement” on clitics is restricted to the identity of reference only, we would still like to know why no such requirement holds for unshared subjects, which, as we saw in (68)b, may freely differ in form as well as in reference.

One might think that the explanation for why pronominal clitics in (76) must have the same referent comes from the fact that the *pro* merged as the specifier of the verb *tepao* ('baby talked') is shared between the conjuncts.⁴⁴ This indeed may be the case, as illustrated in (77).



However, sharing structures more generally allow sloppy identity reading, even when the element bound by two different DPs appears only once in the string (and is therefore by definition shared between the conjuncts). Thus, the Right-Node Raising sentence in (78)a crucially allows the reading in (78)c (Ha, 2007).⁴⁵

⁴⁴ I assume, following Franks (1998, 1999) and Progovac (2005), that clitics are merged as functional heads in the Agr area of the clause and then move to the second position, which might involve a higher functional projection. Clitics are associated with a null pronominal element in the canonical argument position. For concreteness, I assume that this element is a *pro*.

⁴⁵ This is a problem for all multidominance approaches to RNR. I do not have a solution for it in this work.

78. a. John loves and Bill adores his father.

b. John loves Bill's father and Bill adores Bill's father. *Strict identity reading*

c. John loves John's father and Bill adores Bill's father. *Sloppy identity reading*

Given this observation, the fact that *pro* is shared (as indicated in (77)) does not guarantee identity of reference, which, however *is* observed in a BMW.

I propose that the reason why clitics in a BMW must have the same reference lies in the prosody. Clitics are subject to the same constraint as the rest of the non-shared material, namely that *if* they contrast with the corresponding material in the other conjunct, they must be stressed. However, since clitics cannot bear stress, they cannot contrast with the clitics in the other conjunct. Thus, the only way for clitics to appear in each conjunct is for them *not* to contrast, and therefore to be exempt from the stress requirement.

In this section we saw instances of BMWs where more than just wh-phrases go unshared. In section 6.1 we saw BMWs with unshared subjects in English, and we noted that COSH correctly does not rule them out. However, we saw that in a Greek BMW, subjects are obligatorily shared. We saw that this is due to independent, language-specific requirements on the one hand, and to COSH on the other. Thus, the fact that some languages do and some do not require sharing of the subject in a BMW provides support for the analysis of these constructions cross-linguistically, namely for non-bulk sharing constrained by COSH. Finally, in section 6.2 I discussed Croatian BMWs with unshared clitics (and subjects). I argued against the apparent difference between unshared clitics and unshared subjects, namely that the former must be identical in both conjuncts, while the latter need not be. I showed that the apparent identity

requirement on clitics in a BMW may be reduced to independent reasons that lie in the morphology and pragmatics in the case of auxiliary clitics and in the prosody in the case of pronominal clitics.

7. Conclusion

The discussion in this chapter was centered around a BMW. I argued that a BMW, like that in (79) involves two coordinated CPs in which everything except the *wh*-phrases is shared between the conjuncts.

79. What and where does Bob drink?

In sections 2 (on English) and 3 (on Croatian), we saw arguments that the *wh*-object, *what* is syntactically and semantically absent from the second conjunct. Given this fact, I argued that the shared nodes in (79), *does*, *Bob*, and *drink* may not be shared in a bulk, since there is no node in the structure that dominates all the shared nodes but does not dominate (the trace of) *what*. Instead, in section 5 I argued that the shared nodes in a BMW are shared in a non-bulk manner. However, we saw that not all non-bulk sharing structures are admissible. Crucially, if a representation involves sharing, it must conform to COSH. COSH rules out all the structures in which mothers of a shared node do not completely dominate identical sets of terminal nodes. Finally, in section 6 I showed that the proposal makes correct predictions about BMWs in which more than just *wh*-phrases are shared.

Chapter 3: Deriving COSH

1. Introduction

In Chapter 2 we saw that COSH correctly rules out sharing structures that result either in ungrammatical sentences or in sentences with unattested readings. As it stands, COSH is a stipulation. We would like to derive it from principles that are independently motivated. In this chapter, I outline a way to derive COSH from principles of linearization that we need to formulate in order to linearize a BMW (or any other MD structure). The reader should keep in mind, however, that arguments for COSH that we saw in Chapter 2 hold even if at the end of this chapter we find ourselves unconvinced that COSH may be reduced to linearization.

The proposal is fairly simple: I propose that linearization is based on asymmetric c-command⁴⁶ (Kayne, 1994) and that the structures that COSH rules out are inadmissible because no total order among the terminals can be determined, which results in nonlinearizability.

Here and in what follows, I present the linearization proposal without giving the details of how it might work if (contra Kayne 1994) we allow right-adjunction and rightward movement. One might imagine a version of antisymmetry proposal where asymmetric c-command does not uniformly translate into precedence. Rather, in such a version, asymmetric c-command is a prerequisite for two nodes to be *ordered* with respect to one another. However, something else is needed in order to determine whether asymmetric c-command translates into precedence, or subsequence (Johnson, 2007). Whatever that something else is, it is responsible

⁴⁶ We will see shortly that the system proposed here differs significantly from Kayne's original proposal. In particular, given the mechanism of mapping c-command relations onto linear order proposed here, the notion *asymmetric* becomes redundant.

for ordering right-adjoined nodes so that they follow the node they asymmetrically c-command, rather than precede it. Thus, I assume that rightward movement and right-adjunction are possible, and that right-adjoined nodes follow the constituents they are adjoined to.

Let us first take a look at the linearization principles that I propose. I will take Kayne's (1994) Linear Correspondence Axiom (LCA) as a starting point in devising a linearization algorithm that is capable of linearizing MD structures. The LCA is given in (1).

1. *Linear Correspondence Axiom (LCA)*

$d(A)$ is a linear ordering of T ,

(where T is the set of all terminal elements, A is the set of ordered pairs of nonterminals, where the first member asymmetrically c-commands the second, and $d(A)$ is the set of terminals dominated by A).

(Kayne, 1994)

LCA maps asymmetric c-command onto linear order. If a nonterminal category A asymmetrically c-commands a nonterminal category B , then A precedes B . Moreover, the notion of precedence is taken to be strict, i.e. if a nonterminal category A asymmetrically c-commands a nonterminal category B , then *all terminals dominated by A must precede all terminals dominated by B* . Of course, as Kayne himself notes (pg. 67), this is incompatible with MD. This is because for any α that is shared between two nodes, A and B , such that A asymmetrically c-commands B , α would have to precede everything in B , including itself. This leads to a violation of irreflexivity, which is one of the conditions on the linear order.⁴⁷

⁴⁷ An ordering is linear if it is total, antisymmetric, irreflexive and transitive (Wilder 1999).

What we need to do then, is relax the LCA so that it can take an MD structure as its input and deliver a unique total linear ordering of all the terminals as its output. I follow Wilder (1999) in suggesting the following definition for $d(A)$.

2. $d(A)$: the unordered set of terminals *completely dominated* by A .

The definition in (2) has the following result: in ordering a nonterminal node A with respect to a nonterminal node B , if A asymmetrically c -commands B , then all terminals *completely dominated* by A precede all terminals *completely dominated* by B .

I propose the notion of c -command given in (3).

3. *Definition of C-command*

X c -commands Y iff (i) $X \neq Y$, (ii) X does not dominate Y , and (iii) all categories that dominate the head of X dominate the head of Y .

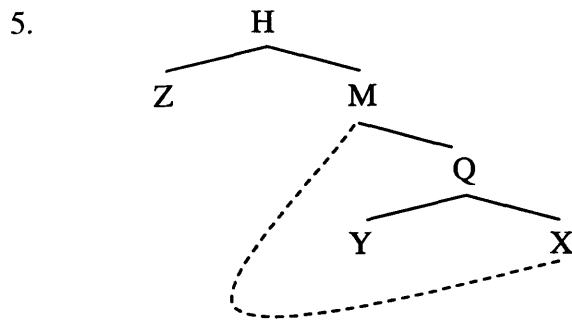
The definition of the relation *dominate the head of* is given in (4).

4. *Dominate the head of*

X dominates the head of Y if

- (i) X is a highest mother of Y (i.e. X is a mother of Y not dominated by another mother of Y), or
- (ii) X dominates the head of a highest mother of Y .

Recall from Chapter 1 that what we usually refer to as ‘movement’ is in fact an instance of sharing, as shown in (5). I referred to this type of sharing as *vertical sharing*. The definition of vertical sharing is stated in (6), repeated from (5) in Chapter 1.



6. *Vertically share*

X and Y *vertically share* α if $X \neq Y$ and:

- i. X dominates Y or Y dominates X, and
- ii. X and Y immediately share α .

In (5), the remerged phrase X is vertically shared between Q and M. Our definition of c-command in (3), together with the notion of *dominate the head of* in (4), ensures that in this configuration, Y does not c-command X. According to our definitions, it is not the case that in (5), all categories that dominate the head of Y also dominate the head of X. Namely, Q dominates the head of Y, but it does not dominate the head of X.

The same would result from keeping the more familiar definition of c-command, given in (7), with a caveat that a remerged node only enters into c-command relations in its derived position.

7. Definition of C-command'

X c-commands Y iff (i) $X \neq Y$, (ii) X does not dominate Y, (iii) Y does not dominate X, and (iv) all categories that dominate X dominate Y.

In the discussion that follows, I will be computing c-command relations using this informal tool, but the reader should keep in mind that this is just for simplicity.

Before we go on to see how a BMW might be linearized, let us first take a look at how the proposal works in the abstract. Consider the representation in (8). In (8), RP c-commands NP. In addition, RP and NP share two non-terminal nodes, W and M. We are interested in what c-command relations hold among the non-terminals in (8). Crucially, if an element undergoes movement/remerge, only its derived position counts for computing c-command. Looking only at the first conjunct, RP, we determine the following c-command relations: Q c-commands Y, W and M, because every node that dominates Q also dominates them. By the same reasoning, Y c-commands W and M. Comparably in the second conjunct, H c-commands Z, W and M, and Z c-commands W and M. Next we look at the first shared node W. W c-commands M, because every node that dominates W also dominates M. Crucially, this is true because *both* WP_1 and WP_2 dominate M, and *all the nodes that dominate* WP_1 and WP_2 dominate M. M itself does not c-command anything.

commands W and M , and they do completely dominate terminals w and m . The same reasoning holds of the relationship between Q and MP_1 , Y and WP_1 , and Y and MP_1 .

Things are, however, more complicated than this. Consider, for example, nodes W and MP_1 . Since they are sisters, we expect them to symmetrically c-command each other. However, this is not the case. Since MP_1 is not shared and W is, MP_1 ends up asymmetrically c-commanding W . While every node that dominates MP_1 also dominates W , the reverse is not the case (WP_2 does not dominate MP_1). However, since MP_1 in (8) completely dominates nothing, no ordering statements are obtained from this asymmetric c-command relation.

Circumstances, however, do arise in which an unshared sister completely dominates some material.⁴⁹ In those circumstances, under the present assumptions, we would get a total but unattested order of terminals, in which the terminals completely dominated by the unshared sister precede the terminals dominated by the shared sister. This is something we would like to block, and in order to do it, I introduce the generalization in (11).

11. *Order between sisters*⁵⁰

If X asymmetrically c-commands Y , X is ordered with respect to Y only if X and Y are not sisters.

The generalization in (11) has the result that asymmetric c-command relation between sisters does not result in any ordering statements. We can now dispense with the reference to *asymmetry* when computing c-command relations. Given (11), c-command between sisters never results in any linear order, and all other c-command relations are necessarily asymmetric.

⁴⁹ See, for instance, example (33) in section 3 below, and gapping examples, discussed in Chapter 4, section 4.

⁵⁰ Bare phrase structure is incompatible with this generalization, without additional assumptions.

Let us return to linearizing (8). The second conjunct is linearized as follows:

12. a. $d(A): \{\langle h, z \rangle, \langle h, w \rangle, \langle h, m \rangle, \langle z, w \rangle, \langle z, m \rangle, \langle w, m \rangle\}$

b. $h < z < w < m$

After X is merged, it c-commands everything in the second conjunct. This results in the $d(A)$ in (13)a and the informal order in (13)b.

13. a. $d(A): \{\langle x, h \rangle, \langle x, z \rangle, \langle x, w \rangle, \langle x, m \rangle\}$

b. $x < h < z < w < m$

Next we look at the relationship between RP and X'. We obtain the following c-command relations: RP c-commands X, NP, H, ZP, Z, WP₂, and MP₂. RP *does not c-command* W and M, since RP *dominates* them. Thus, the set of pairs of non-terminal nodes such that the first member c-commands the second is the following:

14. A: $\{\langle RP, X \rangle, \langle RP, NP \rangle, \langle RP, H \rangle, \langle RP, ZP \rangle, \langle RP, Z \rangle, \langle RP, WP_2 \rangle, \langle RP, MP_2 \rangle\}$

Recall that in ordering a complex node A with respect to a complex node B, we are only allowed to order terminals that are *completely dominated* by A and B. Since WP₂ and MP₂ do not completely dominate anything, no ordering results from the pairs $\langle RP, WP_2 \rangle$ and $\langle RP, MP_2 \rangle$. RP completely dominates q and y , and X completely dominates x , so the pair $\langle RP, X \rangle$ results in (15).

$$15. d(A): \{\langle q, x \rangle, \langle y, x \rangle\}$$

Given the order in (10), we are able to form an informal order in (16).

$$16. q < y < x$$

NP completely dominates only h and z , so from the pair $\langle RP, NP \rangle$ we get (17).

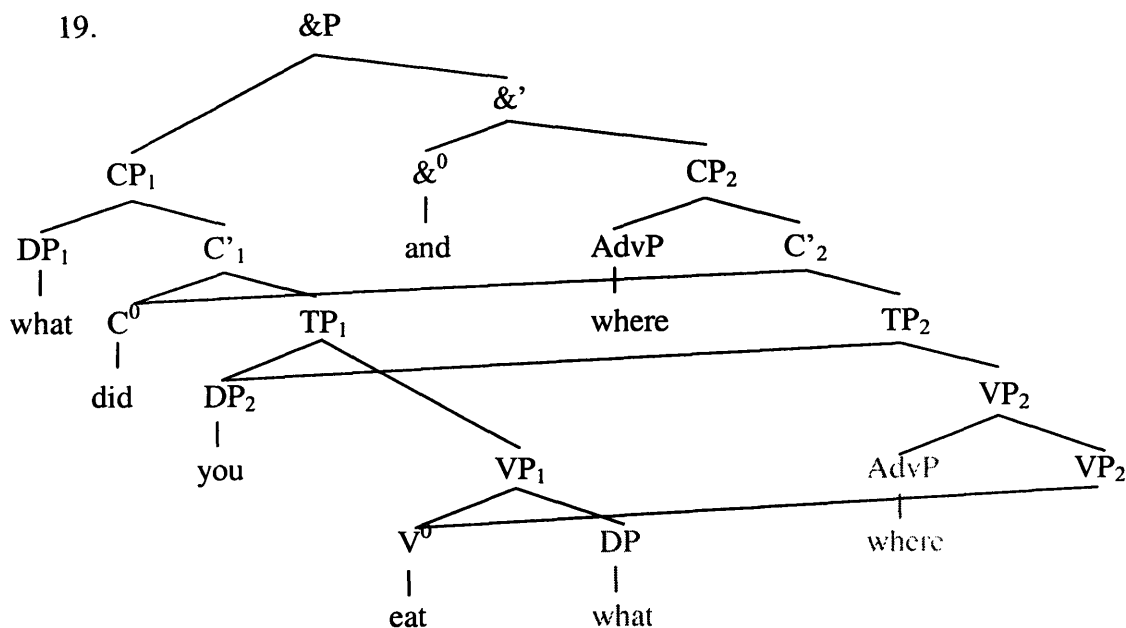
$$17. d(A): \{\langle q, h \rangle, \langle q, z \rangle, \langle y, h \rangle, \langle y, z \rangle\}$$

Putting (17) together (10) with (13) and (16) gives us a total ordering of all terminals in the structure, informally given in (18):

$$18. q < y < x < h < z < w < m$$

2. Linearizing a BMW

With this much in mind, let us take a look at a BMW in (19). For simplicity, I represent the remerged wh-phrases as copies.



C-command relations in the first and the second conjuncts and the precedence relations they give rise to are given in Tables 1 and 2 respectively.⁵¹

Table 1: C-command and precedence relations in the first conjunct in (19)

		C-commandee				Precedence relations
		DP ₁	C ⁰	DP ₂	V ⁰	
C-commander	DP ₁		✓	✓	✓	<i>what</i> < <i>did</i> , <i>what</i> < <i>you</i> , <i>what</i> < <i>eat</i>
	C ⁰	x		✓	✓	<i>did</i> < <i>you</i> , <i>did</i> < <i>eat</i>
	DP ₂	x	x		✓	<i>you</i> < <i>eat</i>
	V ⁰	x	x	x		

⁵¹ In computing c-command relations in individual conjuncts, we note that DP₁ also c-commands, for example, a complex constituent TP₁. This relation, however, results in no ordering, since there is nothing that TP₁ completely dominates, and therefore, by (2), nothing in it can be ordered with respect to DP₁. Similarly, AdvP in the second conjunct c-commands TP₂ and VP₂, but neither of these complex constituents completely dominates anything. However, the relevant c-command relations shown in Tables 1 and 2 are obtained by virtue of the fact that DP₁ in the first conjunct and AdvP in the second conjunct both c-command C⁰, DP₂ and V⁰.

Table 2: C-command and precedence relations in the second conjunct in (19)

C-commander	C-commandee					Precedence relations
		AdvP ₁	C ⁰	DP ₂	V ⁰	
	AdvP		✓	✓	✓	
	C ⁰	x		✓	✓	
	DP ₂	x	x		✓	
	V ⁰	x	x	x		

In addition to the c-command relations in the conjuncts, we also know that the conjunction, &⁰ c-commands AdvP, C⁰, DP₂ and V⁰. This c-command relations translate to the following precedence statements:

20. *and* < *where*,

and < *did*,

and < *you*,

and < *eat*

Thus, before the two conjuncts are conjoined together, we have the following informal orderings:

21. CP₁: *what* < *did* < *you* < *eat*

&': *and* < *where* < *did* < *you* < *eat*

Once the &P is formed, the c-command relations given in Table 3 are formed. However, given our definition in (2), in ordering CP₁ with respect to &⁰ and CP₂, only those terminals

completely dominated by each of the two complex constituents are ordered. Shared material is ignored.⁵²

Table 3: C-command and precedence relations in the &P in (19)

C-commander	C-comandee			Precedence relations
		& ⁰	CP ₂	AdvP
	CP ₁	✓	✓	✓
				<i>what<and,</i> <i>what<where</i>

We now have a total ordering of all the terminals in (19). The sentence is correctly linearized as (22).

22. What and where did you eat?

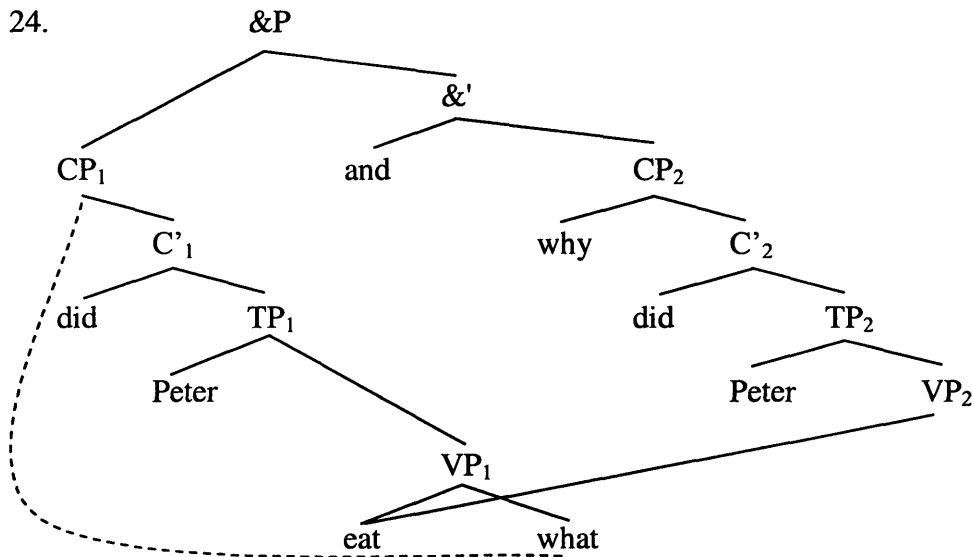
Before we consider structures that violate COSH, let us make sure that a BMW with unshared subjects in (23) also can be linearized by the proposed algorithm.

23. What did Peter and why did Peter eat?

The sentence has the structure in (24).⁵³

⁵² CP₁ does not c-command the non-terminals C⁰, DP₂ and V⁰, since it dominates them. By the definition in (3), no c-command relations may hold between a node and anything it dominates.

⁵³ Here, I follow the proposal by Ko (2005), that *why* is merged directly in [Spec, CP], but nothing hinges on this choice.



Structure (24) is not ruled out by COSH. The only shared node, the verb *eat*, has two mothers, VP_1 and VP_2 , and neither of them completely dominates any terminal nodes. A question arises whether (24) is linearizable. If COSH is a consequence of linearization, we should be able to obtain a unique, total and non-contradictory ordering of all the terminals in the structure. This is indeed the case.

The c-command relations within conjuncts yield the following orders for CP_1 and CP_2 .⁵⁴

25. a. CP_1 : *what* < *did* _{CP_1} < *Peter* _{CP_1} < *eat*

b. CP_2 : *why* < *did* _{CP_2} < *Peter* _{CP_2} < *eat*

The conjunction, *and*, c-commands everything in CP_2 , which means that it precedes everything in CP_2 . This is informally shown in (26).

⁵⁴ I use subscripts CP_1 and CP_2 to indicate which conjunct the subject and the auxiliary belong to.

26. $\&'$: $and < why < did_{CP2} < Peter_{CP2} < eat$

CP_1 c-commands both $\&^0$ and CP_2 . This means that all terminals completely dominated by CP_1 precede all terminals completely dominated by $\&^0$ and CP_2 . We thus obtain the following:

27. a. $CP_1 < \&^0$: $what < and$

$did_{CP1} < and$

$Peter_{CP1} < and$

b. $CP_1 < CP_2$: $what < why$ $did_{CP1} < why$ $Peter_{CP1} < why$

$what < did_{CP2}$ $did_{CP1} < did_{CP2}$ $Peter_{CP1} < did_{CP2}$

$what < Peter_{CP2}$ $did_{CP1} < Peter_{CP2}$ $Peter_{CP1} < Peter_{CP2}$

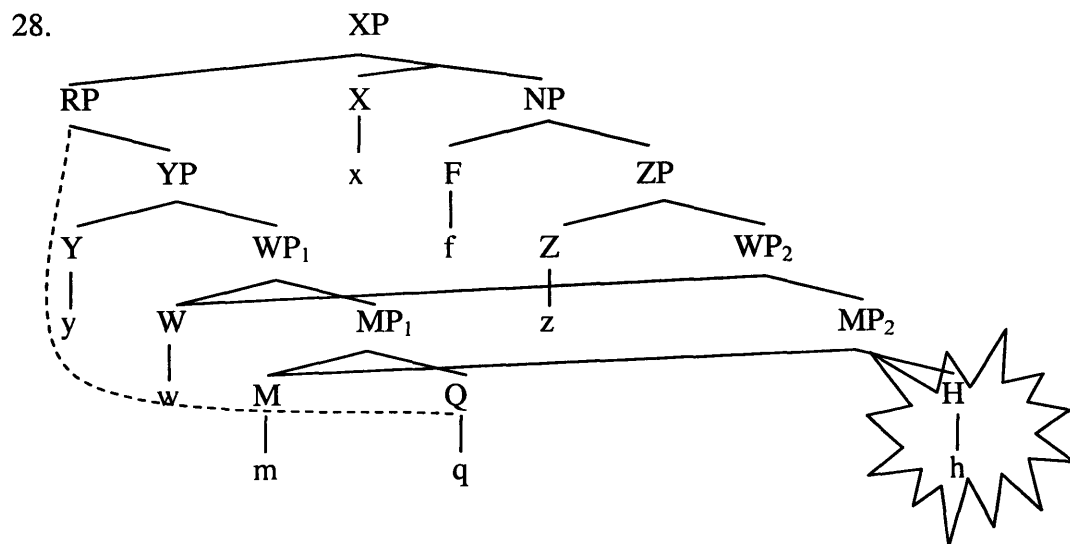
This is a total ordering of all the terminals in the structure. The sentence is correctly linearized as (23).

This is roughly how the linearization works. It is important to note that in a structure which contains shared material, the c-command relations between non-terminals are computed by taking into consideration *the whole structure, and not just individual conjuncts*. This crucially differs from Wilder's (1999) proposal, in which c-command relations that a shared element α enters are computed without taking into consideration nodes that dominate α in the other conjunct. Our view of c-command results in the following: shared material cannot c-command any non-shared material (which by virtue of not being shared appears only in one of the conjuncts), since it is not the case that every node that dominates the shared node dominates the

unshared node. This fact plays a crucial role in ruling out structures that do not obey COSH. In other words, a COSH-violating structure fails to yield a total ordering of all the terminals and consequently, it is not linearizable. Let us illustrate this with an example.

3. Non-linearizable structures

Consider first the structure in (28). It violates COSH, because the mothers of the two shared nodes, M and W do not completely dominate identical sets of terminal nodes. While MP_1 and WP_1 completely dominate nothing, MP_2 and WP_2 completely dominate h .



Let us take a look at c-command relations that hold in (28). They are given in Tables 4 and 5, together with the precedence relations they give rise to.

Table 4: C-command and precedence relations in the first conjunct in (28)

C-commander	C-commandee				Precedence relations
		Q	Y	W	M
	Q		✓	✓	✓
	Y	x		✓	✓
	W	x	x		✓
	M	x	x	x	

Table 5: C-command and precedence relations in the second conjunct in (28)

C-commander	C-commandee					Precedence relations
		F	Z	W	M	H
	F		✓	✓	✓	✓
	Z	x		✓	✓	✓
	W	x	x		✓	x
	M	x	x	x		x

C-command relations from Table 4 translate into the informal order in (29).⁵⁵

$$29. q < y < w < m$$

C-command relations in Table 5, give us the following partial order.

$$30. f < z < w < m$$

⁵⁵ H c-commands M, but since the two are sisters, this does not result in an ordering statement.

Once X is merged, it c-commands everything in CP_2 . This yields (31).

$$31. x < f < z < w < m$$

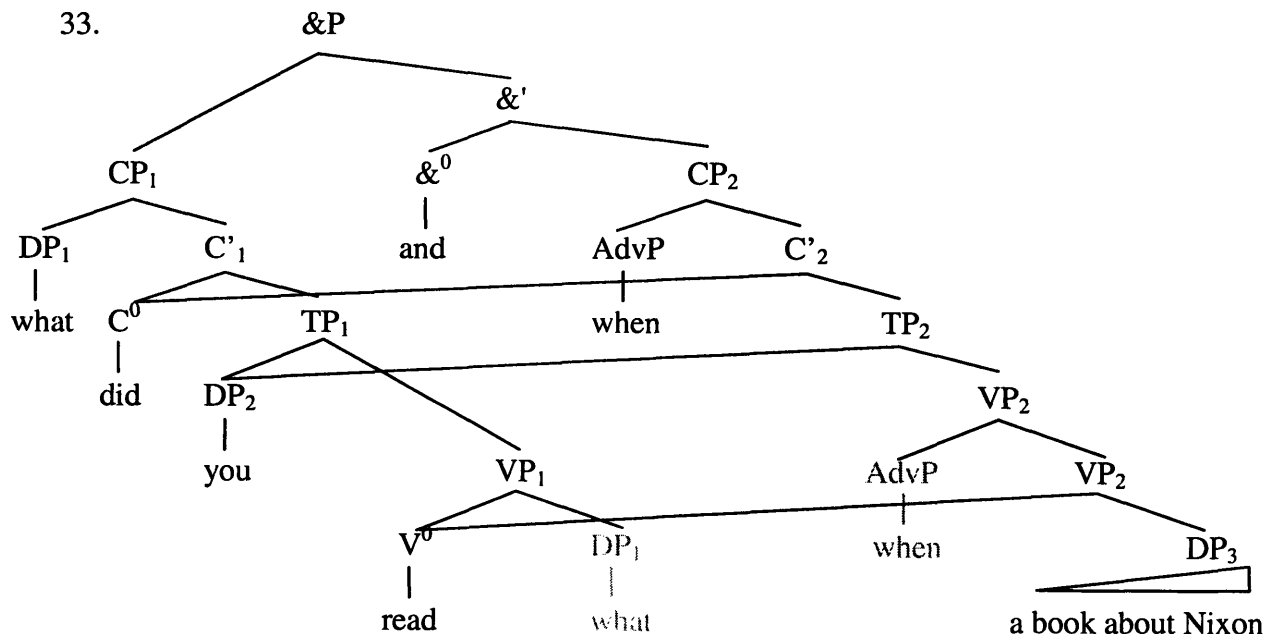
At this point, we know the precedence relations of all the terminals in the first conjunct, but we do not have the total order of the terminals in the second conjunct. In particular, we do not know how to order h with respect to either w or m . W does not c-command H , because W is shared, and there is a node, WP_1 , that dominates W but not H . H does not c-command W because there is a node, MP_2 , that dominates H but not W . H does c-command M , but since the two nodes are sisters, no ordering can be obtained from this relation, by our generalization in (11). This is crucial. Without this generalization, the c-command relation between H and M would result in the order $h < m$. Similarly, MP_2 , given that it is unshared, c-commands the shared W . Since MP_2 completely dominates H , this c-command relation would yield $h < w$, and so on. The linearization algorithm would thus yield a total and non contradictory ordering of terminals that would result in a wrong linear order.

Back to linearizing (28). RP c-commands X and NP . This means that everything that is completely dominated in RP precedes everything completely dominated by X and NP . Thus we obtain (32).

$$32. qy < x f z h$$

Crucially, we still do not know the relative order of *h* on the one hand, and *w* and *m* on the other. This order cannot be deduced from the relative order of RP and NP. Thus, the structure is out, because the c-command relations that hold among the nonterminals in it fail to yield a total order among the terminals.

Let us now turn to a concrete example. Consider the COSH-violating structure in (33), repeated here from (56) in Chapter 2. Recall that COSH rules (33) out because mothers of the shared material *did*, *you*, and *read* in the second conjunct (VP₂, TP₂ and C'₂) completely dominate the unshared DP, *a book about Nixon*, while in the first conjunct, none of the mothers of the shared material (VP₁, TP₁, C'₁) does. If COSH can be derived from the linearization principles, the structure in (33) should not be linearizable. This is exactly what we find.



C-command and precedence relations that hold in the first and second conjuncts in (33) are given in Tables 6 and 7 respectively.

Table 6: C-command and precedence relations in the first conjunct in (33)

	C-commandee					Precedence relations
		DP ₁	C ⁰	DP ₂	V ⁰	
C-commander	DP ₁		✓	✓	✓	<i>what</i> < <i>did</i> , <i>what</i> < <i>you</i> , <i>what</i> < <i>read</i>
	C ⁰	✗		✓	✓	<i>did</i> < <i>you</i> , <i>did</i> < <i>read</i>
	DP ₂	✗	✗		✓	<i>you</i> < <i>read</i>
	V ⁰	✗	✗	✗		

Table 7: C-command and precedence relations in the second conjunct in (33)

	C-commandee						Precedence relations
		AdvP	C ⁰	DP ₂	V ⁰	DP ₃	
C-commander	AdvP		✓	✓	✓	✓	<i>when</i> < <i>did</i> , <i>when</i> < <i>you</i> , <i>when</i> < <i>read</i> <i>when</i> < <i>a book about Nixon</i>
	C ⁰	✗		✓	✓	✗	<i>did</i> < <i>you</i> , <i>did</i> < <i>read</i>
	DP ₂	✗	✗		✓	✗	<i>you</i> < <i>read</i>
	V ⁰	✗	✗	✗		✗	
	DP ₃	✗	✗	✗	✓		

None of the shared nodes in (33) c-commands the unshared DP₃, *a book about Nixon* or anything that it dominates. C⁰ does not c-command DP₃ because there are nodes that dominate C⁰ that do not dominate DP₃, for example C'₁. Similarly, DP₂ does not c-command DP₃ because DP₂ is dominated by TP₁ and C'₁, neither of which dominates DP₃. DP₃ c-commands V⁰, but V⁰ and DP₃ are sisters, which results in the absence ordering statements between them. Crucially, since the verb is shared, it does not c-command subparts of DP₃. This means that no ordering

gets established between any of the shared terminals and the terminals dominated by the unshared DP₃.

Once the conjunction &⁰ is merged, it c-commands AdvP, C⁰, DP₂, V⁰, and DP₃, giving us the orderings in (34).

34. *and* < *where*,
 and < *did*,
 and < *you*,
 and < *read*
 and < *a book about Nixon*

Thus far, we know that the precedence relations in the first conjunct give us (35)a. We also know precedence relations in (35)b, but we still do not know the relative order between the shared nodes *did*, *you*, *read* and DP₃, *a book about Nixon*.

35. a. *what* < *did* < *you* < *read*
- | | |
|-----------------------------------------|----------------------------------------|
| b. <i>when</i> < <i>did</i> | <i>and</i> < <i>when</i> |
| <i>when</i> < <i>you</i> | <i>and</i> < <i>did</i> |
| <i>when</i> < <i>read</i> | <i>and</i> < <i>you</i> |
| <i>when</i> < <i>a book about Nixon</i> | <i>and</i> < <i>read</i> |
| | <i>and</i> < <i>a book about Nixon</i> |

Once CP_1 and $\&'$ are merged together, we order everything completely dominated by CP_1 before everything completely dominated by $\&^0$ and CP_2 . This means that we now know the following order:

36. *what* < *and*

what < *when*

what < *a book about Nixon*

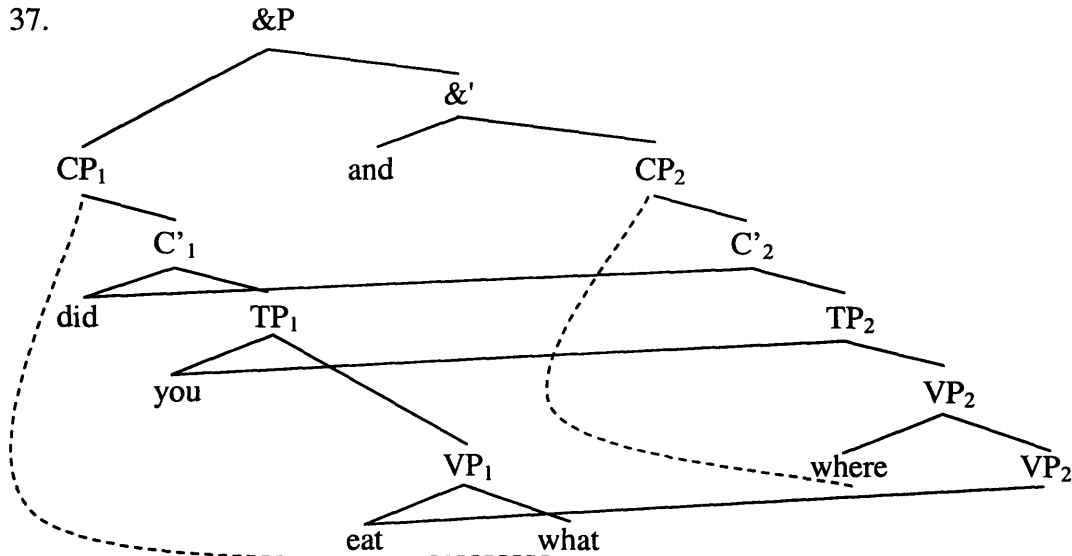
Crucially, we do not obtain ordering statements that relate the shared nodes, *did*, *you* and *read* with respect to *a book about Nixon*. These statements are formed neither by direct inspection of the relevant nodes (given in Tables 6 and 7), nor are they deducible from the orderings that do get established (given in (34) – (36)). Since the ordering that can be established based on c-command relations is not total, the structure is not linearizable.

The problem of non-total ordering arises for all the structures that were ruled out by COSH in sections 5.1.2. and 5.2 of Chapter 2. Thus, it seems promising to explore the possibility that COSH may be derived from principles that are responsible for the linearization of a structure.

In the following section I discuss a potential problem for the theory that posits the linearization algorithm proposed here. It has to do with circumstances that allow movement of *wh*-phrases to [Spec, CP] positions.

4. *Wh-movement in BMW: a Problem?*

So far in this chapter we saw that COSH might be derived from a linearization algorithm that operates on MD structures. In particular, COSH-violating structures were shown to be non-linearizable. This was crucially a result of the fact that a shared node α does not c-command an unshared node β that it would c-command if α were not shared. The reader might have noticed that this fact is potentially problematic for the wh-movement in each conjunct. Movement (remerge) is commonly assumed to be a result of the relation *Agree* that holds between a *probe* and a *goal*, followed by the remerge of the goal in the domain (normally a specifier) of the probe. According to Chomsky (2000), *Agree* happens under c-command. Since wh-movement is a consequence of *Agree* between the interrogative C^0 with an uninterpretable [wh] feature and a wh-phrase, it follows that the probe (C^0) and the goal (the wh-phrase) should stand in a c-command relation. However, in a BMW, we saw that this is not so. In the previous section I argued that the representation in (33) is ruled out precisely because of the lack of c-command between the shared node C^0 (among others) and the unshared DP_3 , *a book about Nixon*. The reader will note that in (37) below the comparable state of affairs holds also between C^0 and the wh-phrase in a pre-movement configuration in each conjunct. C^0 does not c-command the base position of *what* in CP_1 and it does not c-command the base position of *where* in CP_2 . And yet, somehow the wh-phrases end up in the specifier positions of the complementizer.



However, the issue of c-command as a prerequisite for movement does not arise if we follow Rezac (2003) and Richards (2004) who propose that a probe can probe any goal that is present in the tree at the moment of probing. For example, Richards (2004) argues, based on the multiple wh-questions in Bulgarian, that a probe may search its own specifier. If the only requirement on *Agree* is that ‘a probe and a goal be in the same tree’, then C^0 in (37) may still probe the wh-phrase and attract it to its specifier position.⁵⁶

⁵⁶ A question arises whether (37) involves multiple overt wh-movement. It appears that it does. C^0 attracts *what* in the first conjunct, and the same C^0 attracts *where* in the second conjunct. This is potentially problematic. However, it has been proposed that multiple wh-questions in languages like English differ from languages that allow multiple wh-movement only in the number of wh-phrases that get to move *in the overt syntax* (Huang, 1981). We could restate the generalization not in terms of how many wh-phrases *move* overtly, but rather in terms of how many *overt specifiers* multiple attractions may create *in a given CP*. In English multiple wh-questions that do not involve MD, multiple overt wh-movement would be banned because attraction of more than one wh-phrase would necessarily create more than one specifier in a single CP. However, since in (37) only one wh-phrase ends up in a specifier of C^0 *in a given conjunct* (CP), multiple wh-movement might not be a problem.

5. Conclusion

In this chapter I proposed that COSH might be derived from principles that are independently needed in order to linearize an MD structure. I suggested that linearization is based on c-command, with two caveats. One, that a c-command relation between sisters does not yield any ordering statements, and two, that in linearizing a complex object A that c-commands a complex object B, only the material that is *completely dominated* by A is ordered before the material *completely dominated* by B. If this proposal is on the right track, violations of COSH are a consequence of the fact that c-command relations in some sharing structures do not yield a total ordering of all terminals in the structure, and are therefore not linearizable. This is reducible to the fact that a shared node never c-commands an unshared node. In other words, if a node X that in a single (non-MD) tree would c-command a node Y, is shared, then X does not c-command Y. A potential problem for the idea that COSH is derivable from linearization was addressed in section 4, where I also outlined a possible solution.

In the next chapter, I step away from BMWs and examine predictions that my proposal of non-bulk sharing makes for other constructions that presumably involve sharing: ATB questions, Right-Node Raising and gapping.

Chapter 4: Extensions and Predictions

1. Introduction

Recall from Chapter 1 that sharing has been proposed as the correct analysis for several phenomena, including RNR, ATB questions and gapping (for references, see below and Chapter 1, section 1). In this chapter I examine these phenomena in light of my proposals about (non-bulk) sharing and COSH. We will see that sharing approaches to all, ATB questions, RNR and gapping are compatible with COSH, but only if particular analyses of these constructions are adopted.

2. RNR, COSH and Linearization

The term RNR is used to describe coordinated sentences like (1), where there is a constituent, in our case object the DP, *the portrait of a famous political leader*, which is pronounced only once, but seems to be interpreted in both conjuncts. This constituent is commonly referred to as the *pivot*, *target* or *right node*.

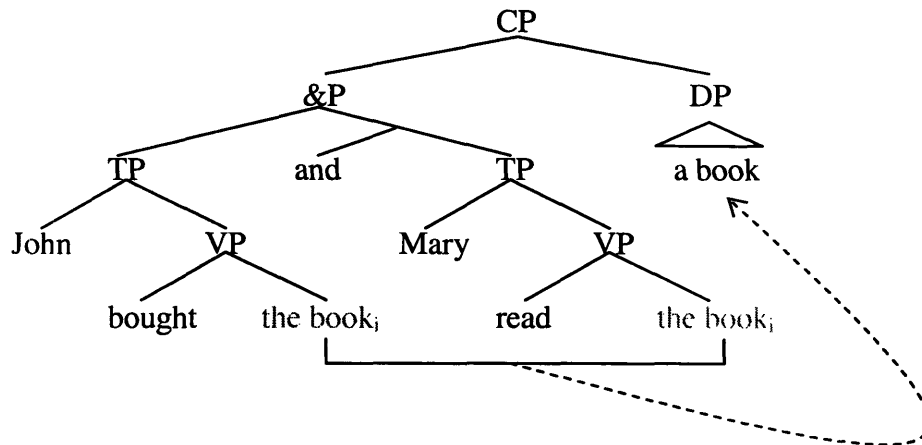
1. John framed and Mary burned *the portrait of a famous political leader*.

The analysis of RNR is notoriously controversial. Ross (1967), Postal (1974, 1998), Hankamer (1977), Abbott (1976), Grosu (1976), Bresnan (1974) and Sabbagh (in press) argue

that RNR is a movement operation, i.e. that the pivot is *moved to the right* from both conjuncts in an ATB manner. This is illustrated in (2).⁵⁷

2. John bought and Mary read *the book*.

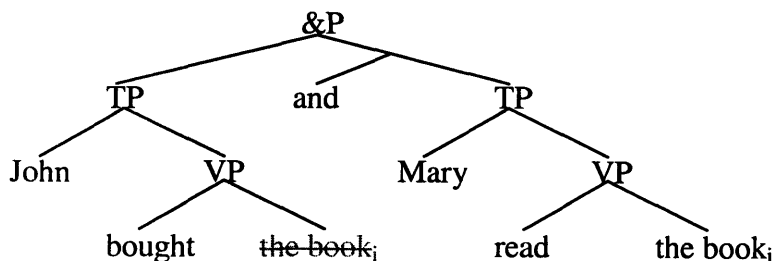
RNR: movement hypothesis



On the other hand, Wexler and Culicover (1980), Swingle (1993), Kayne (1994), Wilder (1997), Hartmann (2000, 2003) and Bošković (2004) propose that the construction is derived by the deletion of the pivot in the first conjunct, as in (3).

3. John bought and Mary read *the book*.

RNR: backward deletion hypothesis

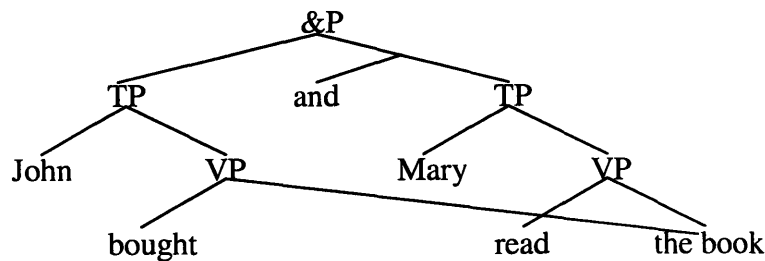


⁵⁷ Under the assumption that ATB movement targets a single shared constituent, the proposal in (2) differs from the one in (4) only in whether the shared constituent moves.

Finally, McCawley 1982, Goodall 1983, 1987, Levine 1985, McCloskey 1986, Muadz 1991, Moltmann 1992, Wilder 1999 and Bachrach & Katzir 2006 argue that the structure does not contain two instances of the RNR pivot at any level. They suggest that the pivot is actually shared between the conjuncts, and that it does not undergo movement. This approach represents RNR as in (4).

4. John bought and Mary read *the book*.

RNR: multidominance hypothesis



RNR is so controversial in part because it shows characteristics of both movement and non-movement. For example, RNR is insensitive to islands. While leftward extraction out of a complex noun phrase is normally not allowed, as shown in (5)a, RNR out of such an island in (5)b is perfectly acceptable.

5. a. *Who do you know a man who likes?

b. Bob knows a man who likes and a woman who hates every fashion designer.

RNR can also separate a preposition from its object in languages that normally do not allow preposition stranding. In (6) below I show this for Croatian (see also McCloskey (1986) for similar data from Irish).

6. a. *Koga je Petar glasao za?

Who *Aux.cl* Petar voted for

‘Who did Petar vote for?’

- b. Petar je glasao za, a Ivan je glasao protiv kandidata desnice.

Petar *Aux.cl* voted for and Ivan *Aux.cl* voted against candidate right.GEN

‘Petar voted for and Ivan voted against the candidate of the right wing.’

However, Sabbagh (in press) shows that there are good arguments for analyzing RNR as a movement operation. For example, an RNR pivot may be shown to take higher scope than is available to the same constituent in a sentence that does not involve RNR. In (7)a, the quantified phrase, *every Germanic language*, may take scope out of an island, even though it is impossible in a non-RNR configuration in (7)b.

7. a. John knows someone who speaks every Germanic language. $\exists < \forall, * \forall < \exists$

(Sabbagh, in press, ex. (33))

- b. John knows someone who speaks and Bill knows someone who wants to learn every Germanic language. $\exists < \forall, \forall < \exists$

(Sabbagh, in press, ex. (34)a)

Sabbagh also shows that RNR is bad if it proceeds out of a coordinate structure in a non-ATB manner. He points out the contrast in (8), where RNR in the (a) and (b) examples seems to violate the Coordinate Structure Constraint (CSC).

8. a. *?Josh was looking for the dean's office, Maria was waiting in and reporters were trying to find Joss' office.
- b. *Josh was looking for, Maria was waiting in the dean's office, and reporters were trying to find Joss' office.
- c. Josh was looking for, Maria was waiting in and reporters were trying to find Joss' office. *(Sabbagh, in press, ex. (54))*

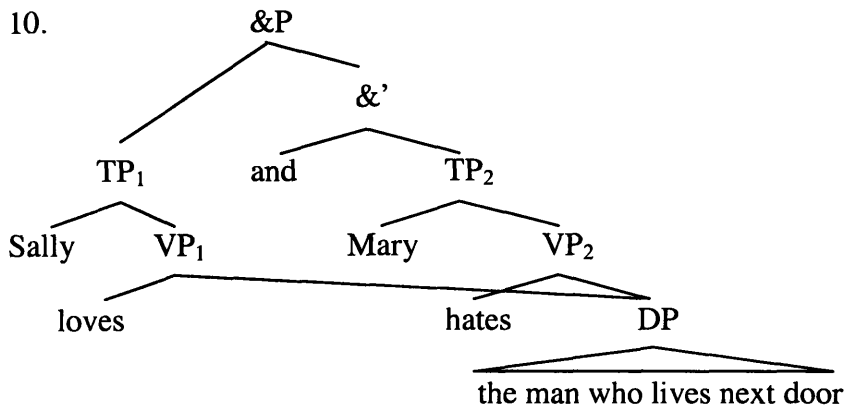
Thus, arguments exist both for and against a movement-style approach to RNR. I am not going to attempt to provide an analysis of RNR in this work. However, it has been proposed that RNR involves sharing, and since this work is concerned with sharing, I here note the predictions that the proposals advanced here make for the derivation of RNR.⁵⁸ We will see that the sharing configuration that has been proposed for RNR violates COSH, even though the c-command relations in the structure yield a total and non-contradictory order of all terminals, which means that the structure is linearizable by the linearization algorithm devised in Chapter 3. Let us first take a look at predictions COSH makes for RNR.

2.1. RNR and COSH

Suppose that RNR involves sharing, i.e. that a sentence like (9) is derived from the (simplified) representation in (10).

9. Sally loves and Mary hates the man who lives next door.

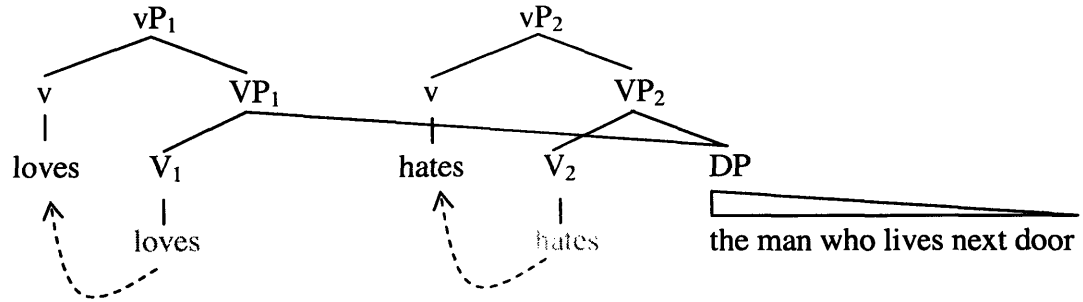
⁵⁸ If it turns out that RNR is a result of deletion, then the present proposals are irrelevant for the phenomenon. However, given Sabbagh's arguments against a deletion analysis, I assume that RNR involves MD, with or without movement.



There is a single shared node in (10), the DP, *the man who lives next door*. It has two mothers, VP₁ and VP₂, and no mother that dominates all its other mothers. VP₁ and VP₂, however, do not completely dominate identical sets of terminal nodes: VP₁ completely dominates *loves*, while VP₂ completely dominates *hates*. Since COSH requires the sets of nodes completely dominated by the mothers of a shared node to be identical, the structure is ruled out. In Chapter 1 I outlined two ways in which a structure like (10) might be modified in order to satisfy COSH. One is to move the offending unshared nodes, *loves* and *hates* to positions where they will not be completely dominated by VP₁ and VP₂. The other is to move the shared node, *the man who lives next door*, so as to create a mother that dominates all its other mothers, thus making the structure vacuously satisfy COSH. The generalization emerges that the verb and its shared object in an RNR configuration may not be sisters.

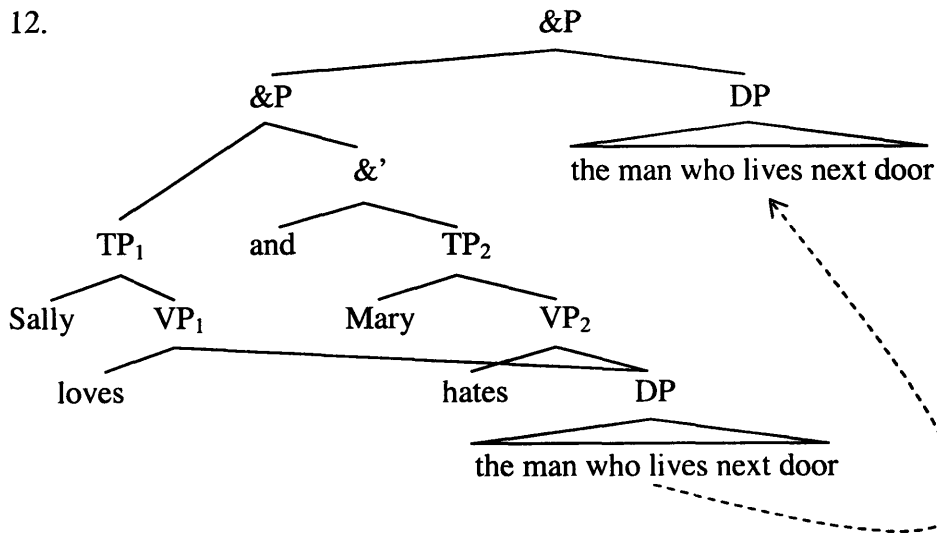
Suppose that English verbs obligatorily move to v⁰ (Larson (1988) Blight (1997)). We could now say that the offending verbs, *loves* and *hates* in (10) move to their respective v⁰'s, as shown in (11). Following these movements, the structure obeys COSH, since now the mothers of the shared material, VP₁ and VP₂ no longer completely dominate anything, in accordance with COSH.

11.



The status of positing V-to-v movement in English is, however, not clear. If it turns out that English verbs need to remain in V^0 , then the structure in (10) must be modified in a different way. The shared DP, *the man who lives next door*, would have to move out of the coordinate structure, so as to create a mother of the DP that dominates all its other mothers. This is shown in (12). Note that this movement obeys CSC, since it proceeds from both conjuncts.

12.

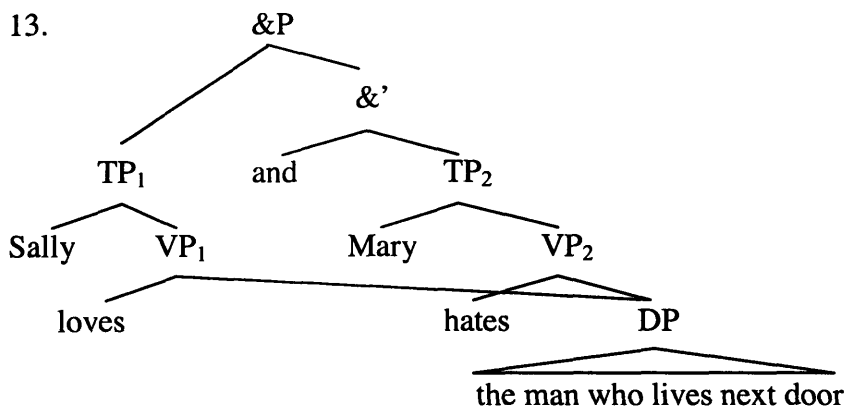


COSH thus seems not to make a clear prediction with respect to RNR, beyond the observation that the unshared verbs and their shared object may not be sisters.

In the following section we will see that a similar situation arises with the linearization algorithm, with a difference that linearization imposes no requirements on the sisterhood of the verbs and the shared object.

2.2. Linearization of RNR

Consider (10) again, repeated here as (13).



Our linearization algorithm provides a total, unique and non-contradictory ordering of all the terminals in (13). The situation is the following. The verb *loves* c-commands the DP *the man who lives next door*. No ordering statements obtain from this relation, given that the two nodes are sisters. However, the verb does c-command the non-terminals dominated by the shared DP: D (*the*), NP (*man who lives next door*). Consequently, the verb precedes them. No issues arise as to what the subject *Sally* c-commands: it c-commands both *loves* and *the man who lives next door*. Based on asymmetric c-command relations in the first conjunct, we get the order that I informally give in (14).

14. *Sally < loves < the man who lives next door*

Similarly, in $\&'$, we obtain the ordering informally given in (15).

15. *and < Mary < hates < the man who lives next door*

In ordering TP_1 with respect to $\&^0$ and TP_2 , we only look at nodes that they completely dominate. We thus get (16).

16. *Sally loves < and Mary hates*

Since we have already established that everything embedded in the shared DP, *the man who lives next door* must follow both *loves* and *hates*, we obtain the linearization in (9), as desired.

It seems that (13) can be linearized “as is”, i.e. nothing in the structure needs to move. At the same time, however, our algorithm is not incompatible with movement. If it turns out that English verbs move to v^0 , our linearization algorithm would still yield the order in (9). On the other hand, it may well be that in the RNR configuration, the pivot must move for independent reasons.⁵⁹ If this is the case, the DP, *the man who lives next door*, would be linearized in its

⁵⁹ Fox & Pesetsky (in preparation) argue that by the end of the derivation, all shared material must have a mother that dominates all its other mothers. They posit *The Total Domination Filter*, given in (i).

- (i) *The Total Domination Filter*
Every constituent α must be totally dominated by some mother of α .

Recall from Chapter 3, that non-bulk shared material in a BMW presumably remains *in situ*, in violation of (i). Thus, if (i) is correct, in light of the data from BMWs, it might be the case that it holds only in cases of bulk sharing.

derived position, presumably right-adjoined to &P, again yielding the order in (9). Recall from Chapter 3 that even though my system for linearizing structures relies on c-command, it is not the case that rightward movement and right-adjunction are impossible (cf. Kayne, 1994). I propose instead that there are circumstances under which the c-command relation translates into subsequence, rather than into precedence. Right adjunction is presumably such a circumstance.

We saw here that if what constrains MD structures is linearization only, RNR is compatible with both the analysis in (2) and the one in (4).⁶⁰ As we saw above, COSH gives us a similar result, with a difference that COSH requires that the verb and the shared object in RNR not be sisters, while the linearization does not impose such a requirement.

RNR is the only structure where COSH and the linearization algorithm make different predictions. Thus, once we learn more about what RNR is, we will have a tool to determine which of the two constraints on MD structures is correct.

Let us next look at ATB questions, which have also been argued to involve sharing.

3. *ATB questions and COSH*

Examples of ATB questions are given in (17).

17. a. What does Bob like and Bill hate?

Object ATB question

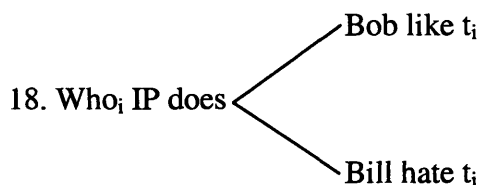
b. Who likes bagels and hates pizza?

Subject ATB question

Alternatively, it may be restricted to RNR. More research is required to determine the exact status of the pivot in RNR.

⁶⁰ Assuming that ATB movement targets a shared constituent.

Under the sharing proposal, an ATB question involves a coordination of TPs, which share the wh-phrase, *what* in (17)a and *who* in (17)b. Analyses along these lines have originally been proposed by Goodall (1983, 1987), Muadz (1991) and Moltmann (1992).⁶¹ For these authors, this is a consequence of a more general proposal that all sentences with coordinate structure are three-dimensional configurations that either result from the union of individual phrase markers (Goodall 1983, 1987) or are base generated and involve multiple *planes* (Muadz 1991, Moltmann 1992). Details of the analyses differ somewhat across the proposed approaches. In Goodall (1983, 1987), ATB questions do not in fact involve *ATB* movement of the shared wh-phrase. Rather, wh-movement applies in individual phrase markers before their union, and the wh-phrase becomes shared only after the two sentences have been united. Muadz (1991) represents the ATB question in (17) as (18). However, for him three-dimensional phrase markers are base generated, which presumably means that (18) involves a three-dimensional structure in which the wh-phrase is base generated in its surface position, and it binds a variable in each plane.

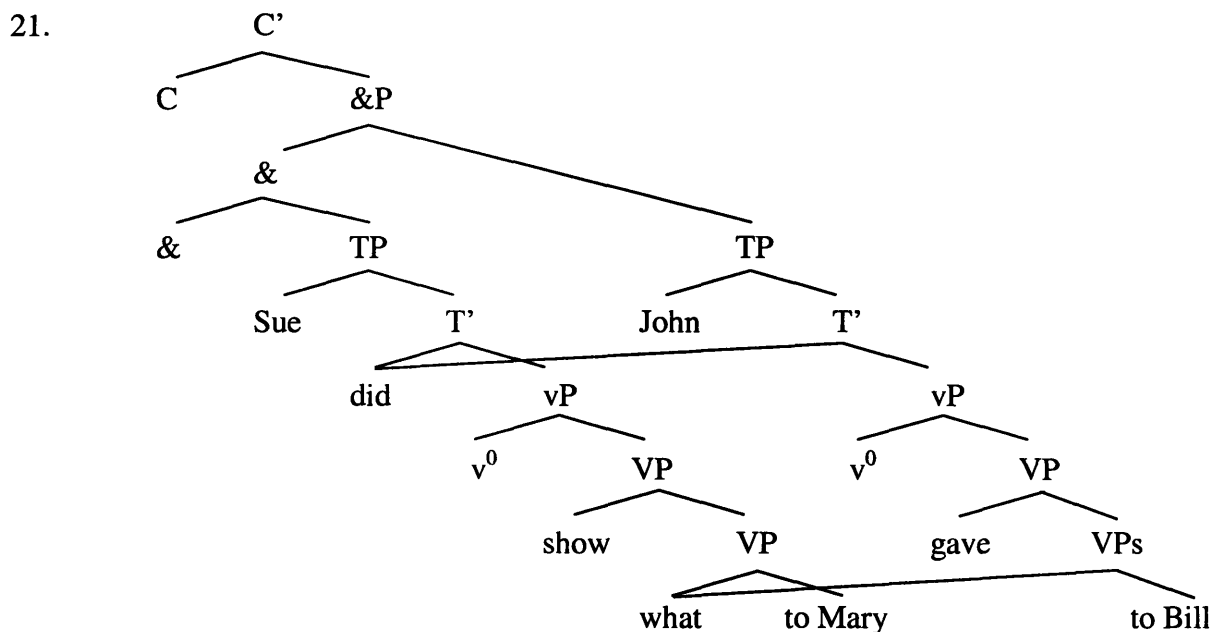
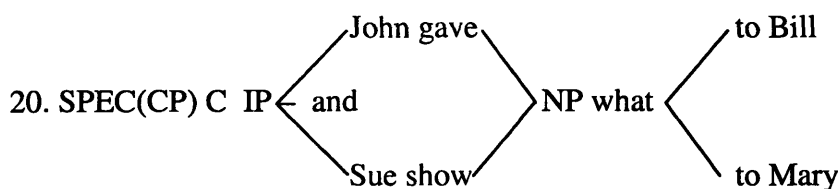


Finally, in Moltmann's (1992) analysis of ATB questions, the wh-phrase is viewed as shared *before* its movement to [Spec, CP]. In this respect, it is equivalent to the more recent sharing analysis of ATB questions proposed by Citko (2000, 2005). Moltmann's representation

⁶¹ Williams's (1978) seminal work on ATB extraction differs from the cited works in that for him, one of the wh-phrases is deleted and the other one is moved to [Spec, CP].

of the pre-movement structure of (19) is given in (20). I model the structure in (21) after Citko's representation of the question 'I wonder what Gretel recommended and Hansel read.' (Citko 2005, ex. (7), pg. 479).^{62,63}

19. What did John give to Bill and Sue show to Mary?

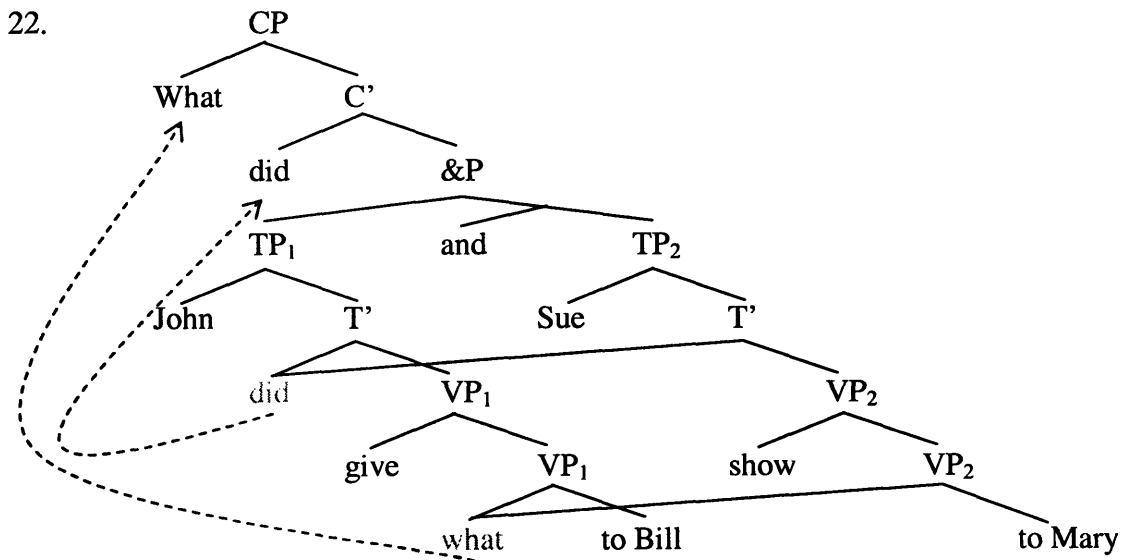


⁶² Moltmann argues based on examples like (19), that a shared node (in her terms, a 'joining node') need not be stipulated to be rightmost in the structure (as was necessary in Muadz's theory). Rather, unless the shared constituent moves, the structure is not linearizable. Similarly, Citko proposes that an MD structure may be linearized only once the shared node is reduced to a trace, since traces are irrelevant for linearization. If my argument that COSH is a consequence of linearization is successful, my analysis of sharing is to be viewed as part of the same family of proposals, where sharing is constrained by whether the structure can be linearized (see also Wilder 1999). However, my proposal differs from Moltmann's and Citko's, and is similar to Wilder's in that a shared node may, in an appropriate configuration, be linearized *in situ* (Chapter 3).

⁶³ In (21), I gloss over the exact position of the indirect object in the individual conjuncts. For concreteness, I represent them as sisters of the direct object (see Bruening (2001) for relevant discussion).

I will assume that the ATB question in (19) has a structure along the lines of (21).⁶⁴ In addition to the wh-phrase, *what* in (21), the auxiliary, *did* is also represented as shared, since in (19) it is pronounced only once.

How does (21) interact with COSH? The pre-movement structure in (21) violates COSH. Each of the two mothers of both shared nodes, *what* and *did* completely dominates material that is not completely dominated by the other mother. The two VPs completely dominate indirect objects *to Mary* and *to Bill*, and the two TPs in addition completely dominate the verbs *show* and *give*. However, once the shared nodes move out of the coordinate structure, as in the simplified diagram in (22), the structure conforms to COSH, since now for each of the shared nodes, a mother is created that dominates all its other mothers (C' for *did*, CP for *what*). Thus, COSH no longer rules the structure out.



⁶⁴ I do not discuss here analyses that treat ATB questions as not involving sharing, such as Munn's (1993) proposal that ATB questions arise by the same mechanism that is responsible for parasitic gaps, or Nuñez' (2001) idea that ATB questions are a result of sideward movement (Nuñez' representation of an ATB question is in all relevant respects equivalent to the sharing proposal, but in his view, the derivation is a consequence of iterative applications of operations copy and merge).

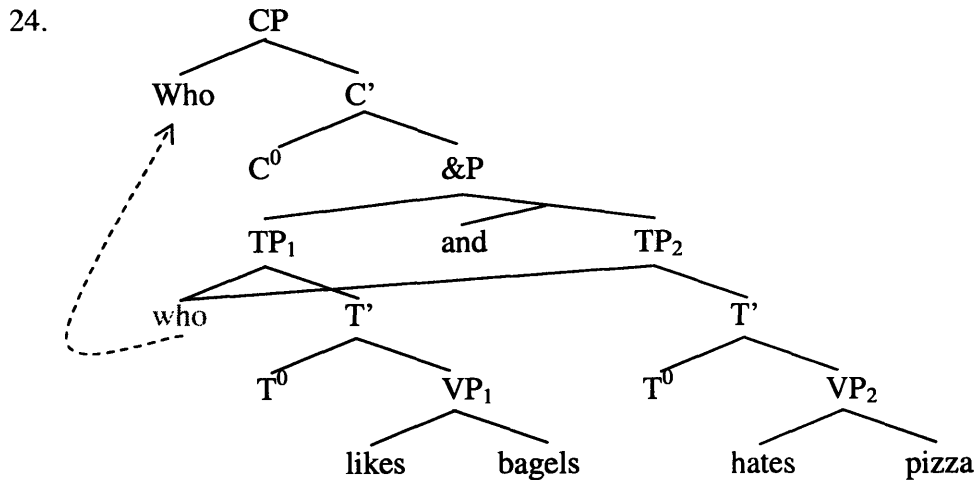
Unlike the representation in (22), the pre-movement structure in (21) is not linearizable by our linearization algorithm. This is because the shared auxiliary neither c-commands nor is c-commanded by any of the unshared material in the individual conjuncts, except for the subjects. This means that no relative ordering can be established between *did* and any of the unshared terminal nodes that do not c-command it (*to Bill*, *to Mary*, *give*, *show*). Similarly, the shared wh-phrase, *what* is c-commanded by the indirect objects, but no ordering statements are formed based on this relation. On the other hand, *what* in its base position does not c-command constituents embedded in the indirect object, and is therefore not ordered with respect to them. However, if (21) is the correct underlying structure for ATB questions, it would not survive without the movements of *what* and *did* even if it were linearizable. Movements of the wh-phrase and the auxiliary presumably take place due to strong features on C^0 , and are thus feature-driven, rather than being motivated by linearization. Once these movements happen, the structure is linearized as (19).

The derivation of a subject ATB question proceeds in the same way. Let us consider the question in (17)b, repeated here as (23).

23. Who likes bagels and hates pizza?

The pre-movement structure contains only one shared node, the wh-phrase, *who*, which moves out of the coordination to [Spec, CP] of the single C^0 . The post-movement structure is shown in (24). The pre-movement structure violates COSH, and is not linearizable under our

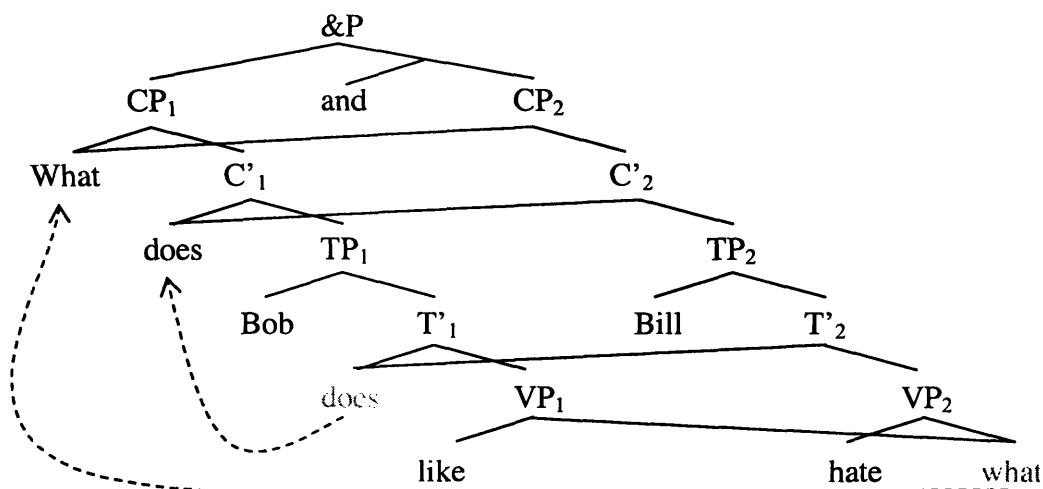
assumptions, but the movement of *who* is again feature-driven, and cannot be attributed to COSH. The post-movement structure obeys COSH and is correctly linearized as (23).



Given the discussion so far, it seems that my proposal of what constrains shared structures is compatible with the analysis of ATB questions that posits the conjuncts to be the size of TPs, with a single C⁰ head that takes the &P as its complement. This analysis straightforwardly explains why the *wh*-phrase and the auxiliary (raised to C⁰ from both conjuncts) are pronounced only once (but are interpreted more than once). However, note that this fact is also compatible with a different analysis. We could ask whether an ATB question in (17), repeated here as (28), might be derived from a representation such as (26), where the conjuncts are the size of CPs, with a shared C⁰ and its specifier.

25. What does Bob like and Bill hate?

26.

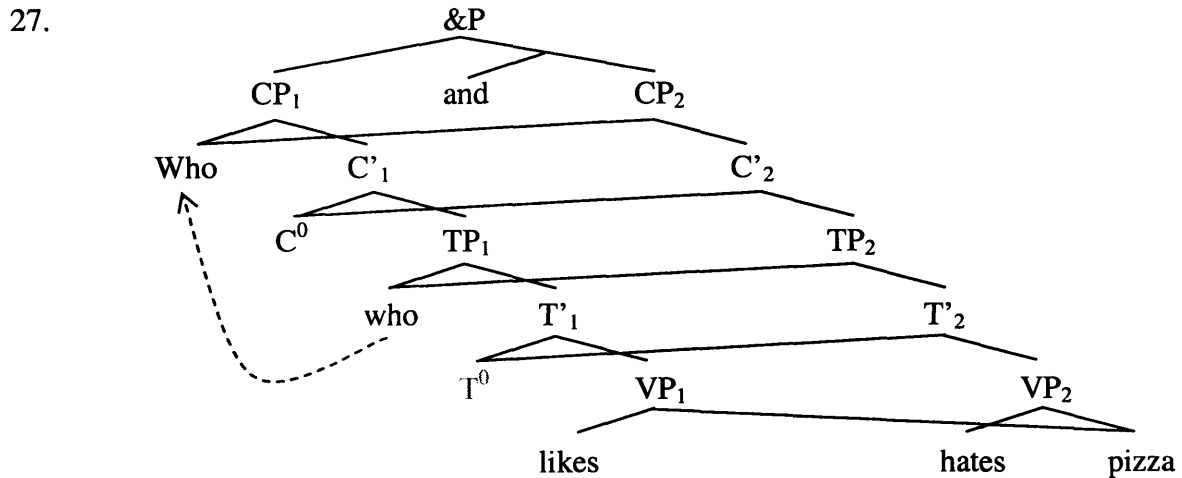


In (26), the shared material, *what* and *does*, is also predicted to be pronounced only once, just by virtue of being shared. However, (26) cannot be the right structure for (25). It massively violates COSH – the condition is satisfied for neither of the shared nodes. As is, the structure is also non-linearizable, since in their derived positions the shared nodes *what* and *does* neither c-command, nor are c-commanded by any of the unshared material. This results in the lack of ordering statements that establish the relative order between (any of) the shared nodes with (any of) the unshared nodes.

Note that (26) would conform to COSH if both shared nodes moved to left-adjoin to CP. However, since in English a *wh*-phrase does not normally leave the [Spec, CP] where it takes scope, this seems unlikely.⁶⁵ In addition, since the two shared nodes in (26) do not form a constituent, their movements would have to proceed independently of one another. In Chapter 5, section 5 I argue that this is problematic for other reasons.

⁶⁵ According to Kayne (1994), specifiers and adjuncts are in fact same kinds of structural positions. Movement from a specifier of a maximal projection to a position adjoined to the same maximal projection thus seems even less plausible. Also, see Pesetsky & Torrego (2001), Grohmann (2000, 2003), Abels (2003) for the idea that movement may not be too local.

The result is similar for the CP-conjunct representation of the subject ATB question in (27). The structure violates COSH and is not linearizable by our principles of linearization.

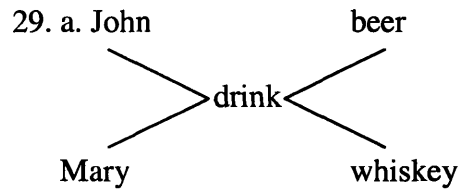


Thus, even though (26) and (27) are logical possibilities for deriving ATB questions, they are ruled out by our condition on the well-formedness of MD structures.

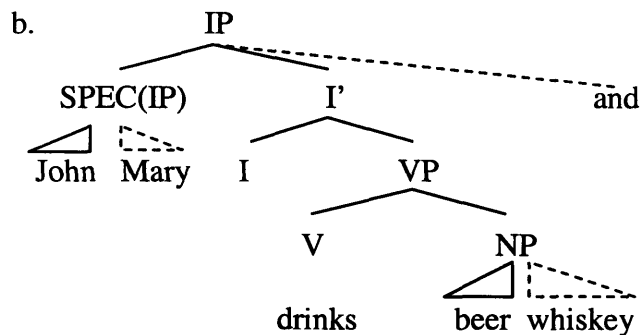
4. Gapping and COSH

Goodall (1983, 1987), Muadz (1991) and Moltmann (1992) propose that gapping is also derived by sharing. In these works, a gapping sentence, such as the one in (28) is represented as in (29)a and (29)b below.

28. John drinks beer and Mary whiskey.



Gapping (Goodall, 1983)



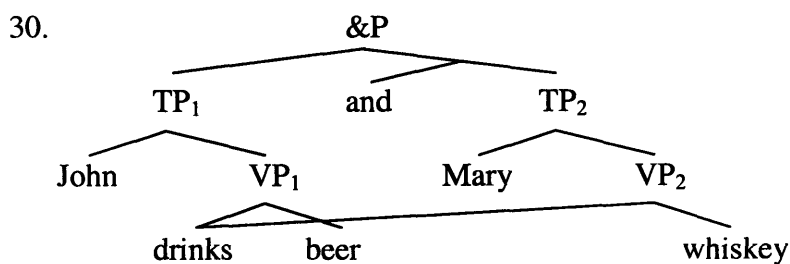
Gapping (Muadz, 1991)

Johnson (2000, 2004) proposes that gapping is a result of an ATB movement of the verb from both conjuncts to T^0 (or some other functional head above &P). He does not discuss whether the underlying representation involves *sharing* of the verb between the conjuncts in our sense of the term, or it contains two instances of the verb, which are after the movement (or by virtue of it) somehow reduced to one. I believe that Johnson's analysis is compatible with the proposal that the verb is shared, under the assumption that ATB movement always targets shared constituents.

I argue here that if gapping is a result of sharing of the verb between two conjuncts, the structure must be more involved than the ones given in (29)a and (29)b. We will see that the approach to sharing advanced in this dissertation gives support to the analysis of gapping proposed by Johnson (2000, 2004), and to an extent the analysis proposed by Lin (2002). Both of these authors propose that gapping involves coordination of small conjuncts (vPs), which is then merged with a single higher T^0 , to whose specifier the subject of the first conjunct moves (in

apparent violation of CSC). The two analyses differ with respect to whether the verb is shared and moves out of &P in an ATB fashion (Johnson) or is not shared and the verb in the second conjunct is deleted under identity with the verb in the first conjunct (Lin). The need that the structure satisfy COSH will be shown to provide support for the Johnson's analysis of gapping, where it is analyzed as involving an ATB movement of the shared verb.

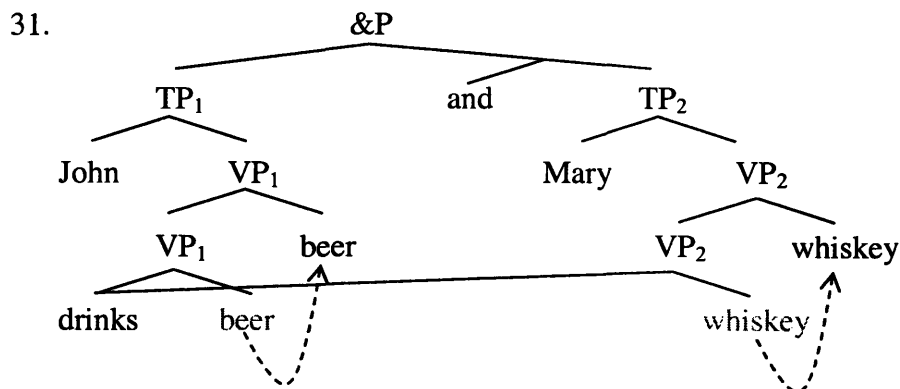
Let us first consider the approach to gapping proposed by Goodall, Muadz and Moltmann. Diagrams in (29)a and (29)b are, I believe, equivalent to the representation in (30) below.



The representation in (30) violates COSH. The mothers of the shared verb, VP₁ and VP₂ completely dominate *beer* and *whiskey* respectively, in violation of COSH.

Structure (30) is also not linearizable by our linearization algorithm. The shared verb and its unshared objects are sisters and therefore no ordering statements arise from their c-command relation, even though the unshared objects do c-command the shared verb, but the converse is not the case. Note that even if the objects were complex, the verb would still not c-command the non-terminals embedded in them. Since the verb is shared, it cannot c-command an unshared node, no matter how deeply embedded the unshared node is.

Let us now take a look at what movement operations might “save” the structure in (30), i.e. make it conform to COSH. One possibility is to raise both objects, *beer* and *whiskey*, so that they are no longer completely dominated by VP₁ and VP₂ respectively, as in (31).⁶⁶



Recall from section 2.2 of this chapter that in the present approach to linearization, right-adjunction and rightward movement are not disallowed (contra Kayne 1994), but rather that asymmetric c-command from a right-adjoined position translates into subsequence, and not into precedence. The following c-command relations hold in individual conjuncts: *John* and *Mary* c-command everything else in their conjuncts and the raised objects *beer* and *whiskey* c-command the shared verb, *drinks*. The raised objects are right-adjoined, and therefore they follow the verb. The conjuncts in (31) are therefore linearized as in (32).

32. a. TP₁: *John* < *drinks* < *beer*

b. TP₁: *Mary* < *drinks* < *whiskey*

Once the conjunction is added, we get (33).

⁶⁶ Both objects must remain within their respective conjuncts, due to the CSC.

33. $\&'$: *and* < *Mary* < *drinks* < *whiskey*

Now, when linearizing TP_1 with respect to $\&^0$ and TP_2 , we are only looking at the material that is completely dominated by these nodes. The shared verb is ignored. This gives us (34).

34. *John beer* < *and Mary whiskey*

The order we get is total, but it is contradictory (it violates transitivity). We know from (32)a that the verb, *drinks* must precede *beer*, and from (33) that it also must follow the conjunction, *and*, as well as the subject of the second conjunct, *Mary*. However, by (34), *beer* must precede both *and* and *Mary*. Thus, the verb must simultaneously satisfy two requirements that contradict each other. It seems then that raising the objects in (31), while it helps satisfy COSH, results in a non-linearizable structure.

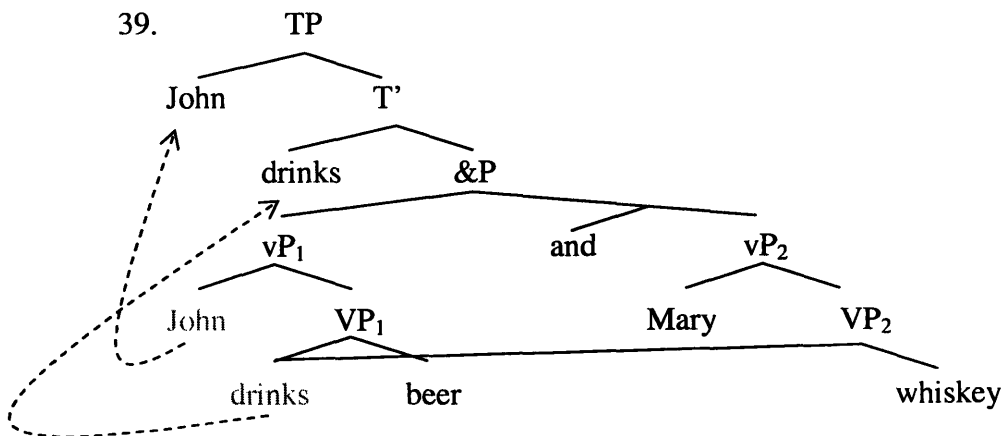
There is, however, a different set of movements that might apply to the structure in (30), such that they yield a linearizable structure. Suppose that, instead of moving the objects, we move the shared verb to a position outside the coordinate structure, and that we also move the subject of the first conjunct, *John* to a position higher than the derived site of the verb. This is illustrated in (35).

Recall that *John* and *drinks* must precede the whole &P. The final order is given in (38).

It is total and non-contradictory.

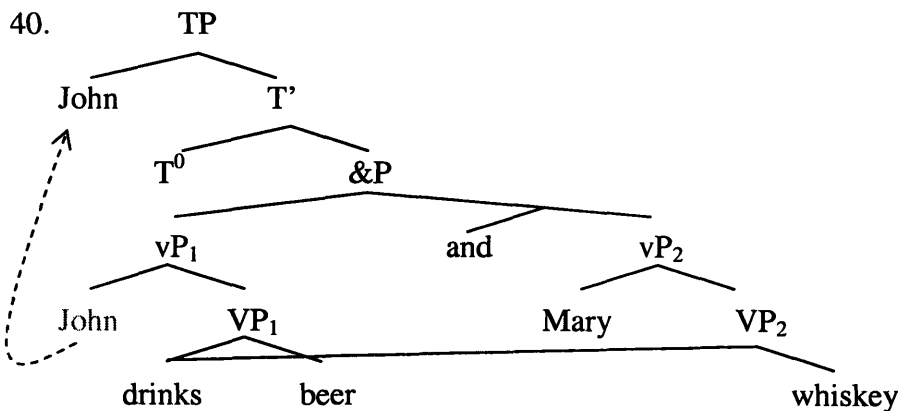
38. John drinks beer and Mary whiskey.

The reader might object to the independent movements of the subject of the first conjunct, *John* and the shared verb, *drinks* to positions adjoined to &P. Indeed, in section 4 of Chapter 5 I argue against such individual movements of terminal nodes in the case of a BMW. However, the movements posited in (35) to satisfy COSH become more plausible if we follow Johnson (2000, 2004) and Lin (2002) in assuming that conjuncts in a gapping sentence are not TPs, but rather vPs. In that case, the shared verb, *drinks* moves to T^0 (or a lower functional projection above &P), while the subject of the first conjunct, *John*, moves to [Spec, TP], as shown in (39).



Thus, COSH seems to support the view of gapping in which the conjuncts are no bigger than vPs (contra Goodall 1983, Muadz 1991, and Moltmann 1992), and the structure contains a single T^0 , which attracts the subject of the first conjunct to its specifier position.

Note that once we posit the structure in (39), the movement of the subject, *John* to [Spec, TP] becomes obligatory for independent reasons (since an English sentence must have an overt subject in [Spec, TP], presumably due to the EPP feature on T^0). Once this movement takes place, the structure looks as in (40), where the verb *in situ* still violates COSH, as it did in (30). We saw that moving the objects, *beer* and *whiskey* does not result in a linearizable structure. The only other option is to move the shared verb, and T^0 (or perhaps another functional head above &P) is the most plausible landing site for it.



Thus, under this approach, the exceptional verb movement in gapping sentences in English is driven by the need for the structure to satisfy COSH. This movement, while motivated by linearization, is compatible with general principles of grammar, since it reduces to regular head-movement.

The reasons why the head to which the verb moves might not be T^0 become clear once we consider sentences like (41). In (41), the structure contains a modal in addition to the gapped verb. Assuming that modals are inserted in T^0 , it seems that the position to which the verb moves is not T^0 , but some lower projection that is, however, outside of the coordinate structure (outside of vP).

41. Sue can't eat beans and Bill peanuts.

A related problem concerns the position of the verb relative to an adverb. In (42), *often* is interpreted as scoping only over the first conjunct, but it precedes the verb, *reads*.

42. John often reads books and Mary sometimes magazines.

Fox and Pesetsky (2003) suggest that the English verb raises to T^0 , just like the French verb does. It ends up following adverbs, due to the fact that adverbs also move, crucially to a position where it will precede the verb. This is required in order for the ordering statements in the higher Spellout domain (adverb < verb) not to contradict ordering statements established at a lower Spellout domain, presumably vP (adverb < verb). If this proposal is on the right track, it might explain (42). What remains unclear is why the adverb from the first conjunct may move out of the coordinate structure, without incurring a CSC violation.

However, whether the surface gapping structure is a result of COSH/linearization or independently motivated principles is an open question. Here, I note that it may well be that principles other than COSH are at stake in gapping sentences. This is because gapping more

generally shows properties that make it look distinct from other instances of non-bulk sharing, namely from BMWs.

4.1. Differences between gapping and BMWs

In Chapter 2 I argued that BMWs, like that in (43), are derived through non-bulk sharing of all terminal nodes except for wh-phrases.

43. What and when did John teach?

In sections 2 and 3 of that Chapter we saw arguments that a BMW is well-formed only if both underlying conjuncts are well-formed. I argued that the object wh-phrase in a BMW is absent from the second conjunct. One of the arguments to this effect involved the observation that a BMW is well-formed only if it contains an optionally transitive verb. We concluded that this is because only a verb that does not *require* an object may surface without it in the second conjunct. Given that the object wh-phrase is absent from the second conjunct, a BMW only has the *at-all*-reading, i.e. the wh-object is not part of the interpretation of the second conjunct.

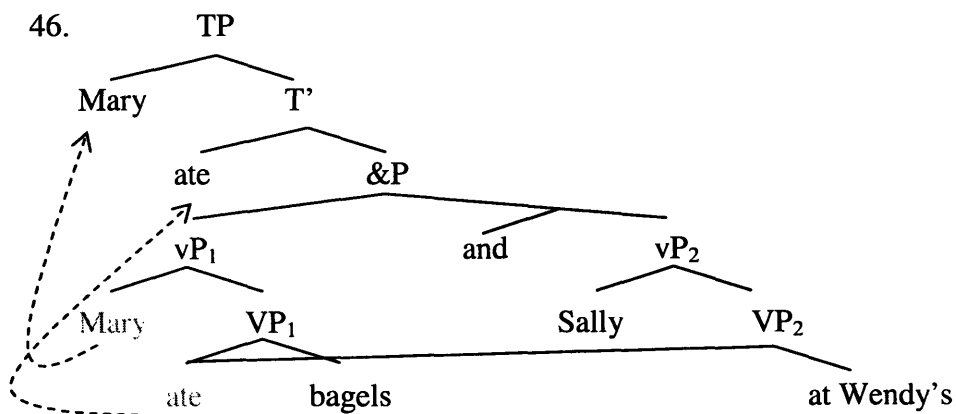
If gapping is derived by sharing the verb between the conjuncts, to the exclusion of the rest of the material, we expect a gapping sentence with an optionally transitive verb to at least allow a reading that is comparable to the *at-all*-reading, contrary to fact. Let us compare the BMW in which subjects are not shared in (44) with the gapping sentence in (45).⁷⁰

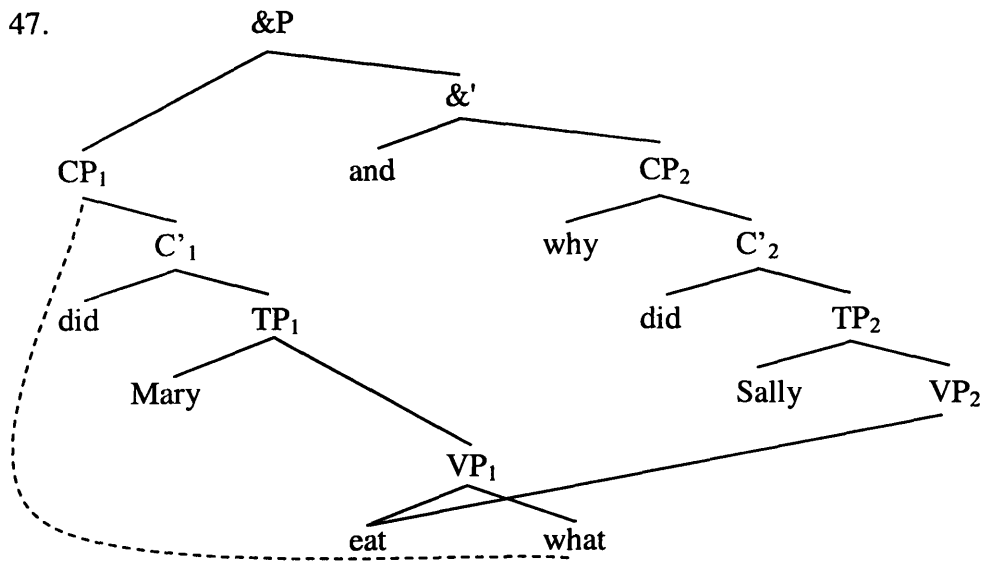
⁷⁰ I use here a BMW with unshared subjects, because in these only the verb is shared, as is the case in a gapping sentence. Thus, (44) and (45) form a minimal pair of sorts.

44. What did Mary and where did Sally eat?

45. *Mary ate bagels and Sally at Wendy's.

While (44) is well formed, (45) is ungrammatical (cf. (28)). Presumably, the reason why (45) is out is the fact that the verbs in the two conjuncts are not parallel in transitivity (Stillings, 1975). This discrepancy in the valency of the verb, however, has no effect on the grammaticality of (44). If gapping involved a structure like (46), we would expect it to be subject to the same requirements that the structure of the BMW in (47) is subject to. In particular, we would expect the sentence in (45) to be grammatical, since under the sharing proposal, both conjuncts in (46) are well-formed. As we have seen, this is not what we find.





Similarly, the sentence in (48) seems only to allow the reading where Mary ate *bagels* at Wendy's. It does not have the reading where Mary ate (something else) at Wendy's.

48. Bob ate bagels at McDonald's and Mary at Wendy's.

Thus, gapping seems to be more constrained than BMWs. While the only two requirements on a BMW are well-formedness of individual conjuncts and COSH, gapping seems to be subject to additional constraints. Namely, the non-gapped material in each conjunct of a gapping sentence must contrast with the corresponding material in the other conjunct. Reasons for this requirement are still obscure. It is therefore not unreasonable to ask whether the movement of the verb in gapping is forced by the need of a structure to satisfy COSH alone or it is motivated by principles that are independent and perhaps related to the properties of gapping that set it aside from instances of non-bulk sharing I argued for in a BMW.

In sum, in this section I showed that gapping cannot involve a structure that Goodall (1983), Muadz (1991) and Moltmann (1992) propose for it. This structure violates COSH and is also non-linearizable. We saw that COSH gives support to the analysis of gapping that involves a coordination of vPs, with the subject of the first conjunct and the shared verb moving out of the coordinate structure (Johnson 2000, 2004). In fact, COSH provides motivation for the movement of English verbs to T^0 (or some lower projection above the coordinated phrase), which seems to be restricted to gapping.

However, given that the properties of gapping seem to differ from the properties of other structures that I argued involve sharing of the verb alone, namely from BMWs, it is plausible to entertain the possibility that movement of the shared verb in a gapping structure is not directly motivated by COSH, but needed for other reasons.

In the final section of the chapter, I examine what we might call ‘Left-Node Raising’ (LNR), i.e. a configuration in which shared material is pronounced to the left of all the unshared material. In a way, I have already discussed one phenomenon that fits the description, namely ATB questions. However, in a language like English, a wh-phrase more generally moves to the left periphery of the clause, and the fact that in an ATB question it is shared does not affect this movement. Importantly, the movement of a shared element out of the coordinate structure saves the representation from violations of COSH (alternatively: makes it linearizable). If shared material were base generated at the left edge, given the standard assumption that “leftier” is higher, it would end up being structurally higher than unshared material, which, as we saw in (27), yields a COSH violation. Thus, if shared material is base generated to the left of the unshared material, it would have to undergo additional leftward movement in order for the

structure to satisfy COSH. In the following section I show that the shared material cannot surface at the left edge of the sentence if it is (i) base generated there and (ii) it is otherwise banned from moving leftwards.

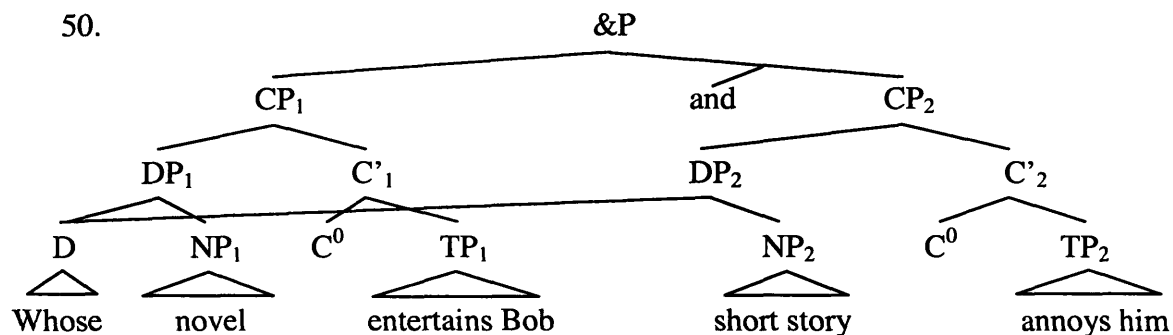
5. Left-Node Raising?

To start our investigation of LNR, consider first the ungrammatical sentence in (49)a, with the intended meaning in (49)b.

49. a. *Whose novel entertains Bob and short story annoys him?

b. Whose novel entertains Bob and whose short story annoys him?

The meaning in (49)b might be derived if the underlined constituent in (49)a were shared between the conjuncts, as shown in (50).



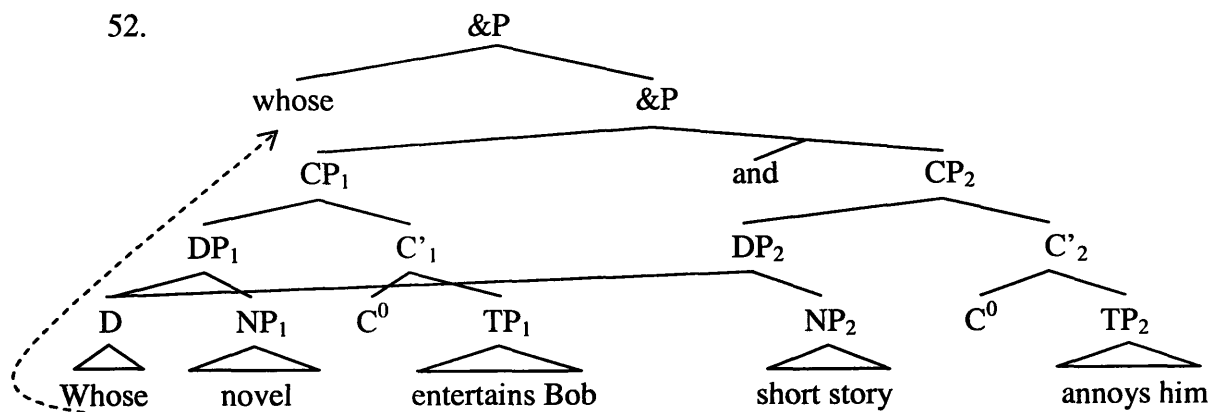
Of course, as it stands, (50) cannot survive. COSH rules it out since the mothers of the shared node do not completely dominate identical sets of terminal nodes: DP₁ completely dominates NP₁, *novel*, while DP₂ completely dominates the NP₂, *short story*. Moving the

relevant NPs, *novel* and *short story* to a position where they would not be dominated by the mothers of the shared material is problematic. As shown by (51), it seems to be impossible to extrapose the NP away from the wh-phrase, *whose*.

51. *Who said that Mary read whose __ yesterday novel?

The fact that in (50) the wh-phrases, *whose novel* and *whose short story* are subjects makes this movement even more unlikely.

The other movement that might save (50) from a COSH violation is to move the wh-phrase *whose* to a position where a mother would be created for it that dominates both DP₁ and DP₂, i.e. to a position outside &P, as shown in (52).



The movement in (52) is, however, also problematic, as shown by the ungrammaticality of (53).

53. *Whose Mary said (that) __ novel entertains Bob?

Thus, the structure in (50) is doomed, since all movements that might save it from a violation of COSH are independently ruled out in the language.

The LNR example in (49), contrasts with ATB questions, in which the shared material does surface to the left of all unshared material. The crucial difference is that in ATB questions the movement that the shared wh-phrase undergoes is more generally allowed, while in LNR examples, movement of the shared material is independently prohibited.

The prediction is, however, that in a language where one of the two rescue strategies outlined above is allowed, the sentence comparable to (50) should be grammatical. This is exactly what we find in Croatian. The sentence in (54) is well formed.

54. Čiji roman nasmijava Petra a članak ga istinski zanima?

Whose novel makes-laugh Petar and article him truly interests

‘Whose novel makes Petar laugh and article truly interests him?’

Example (54) presumably has the same underlying structure as the English example in (50), which violates COSH. The fact that (54) is grammatical indicates that one of the rescuing movements must have applied, and that the final structure obeys COSH. In fact, we will see that in Croatian it is possible both to move the NP rightwards, away from the wh-phrase *čiji* (‘whose’) and to move the wh-phrase *čiji* (‘whose’) leftwards, away from the NP *roman* (‘novel’).

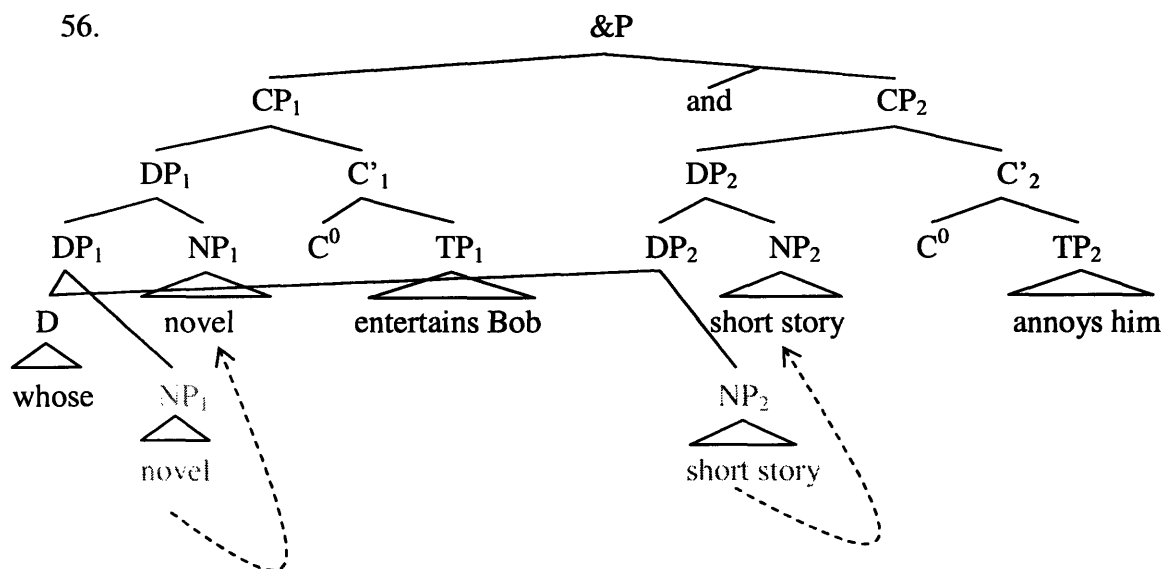
That the movement of the NP is allowed is shown by the example in (55).

55. Tko je rekao da je Marija pročitala čiji jučer roman?

Who *Aux* said that *Aux* Marija read whose yesterday novel

‘Who said that Marija yesterday read whose novel?’

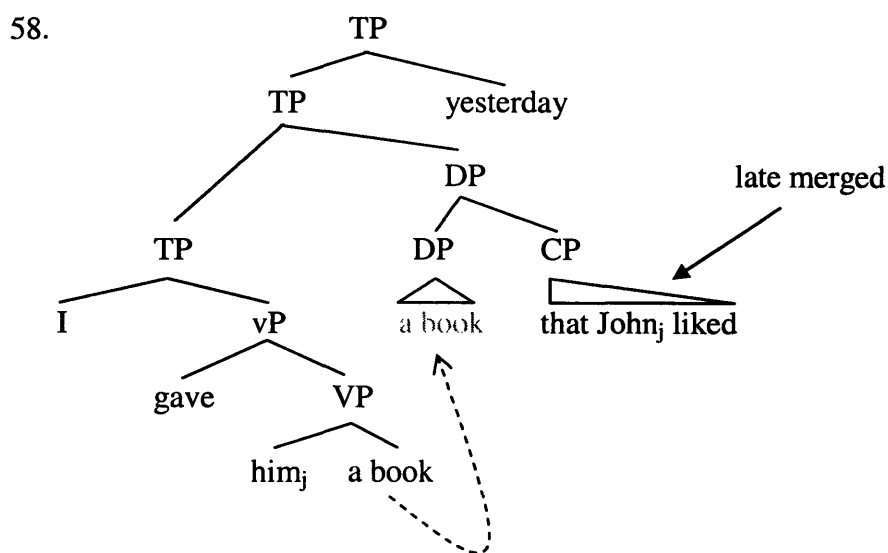
Thus, the Croatian version of (50) may be saved by moving the NPs *roman* (‘novel’) and *članak* (‘article’) to positions where they are not completely dominated by the mothers of the shared node, *whose*, as shown in (56).



The movements of NPs in (56) involve string vacuous extraposition. We know that the movement is string vacuous because in both conjuncts, the NPs end up preceding the TPs, *entertains Bob* and *annoys him*. Fox (2002) suggests that there is a ‘parsing preference that chooses an analysis with no extraposition whenever possible’ (pg. 75). He argues that this parsing preference is responsible for a degraded judgment that (57) receives.

57. ^{??}I gave him_j a book that John_j liked yesterday.

According to his proposal, there is an analysis of (57) which would save the sentence from a condition C violation. This analysis involves covert rightward movement of the DP, followed by the late merge of the relative clause, as shown in (58) (Fox and Nissenbaum, 1999).



However, since there is also an analysis that does not posit extraposition (where the relative clause is adjoined to the base position of the DP, *a book*), the parser chooses it over the one in (58), even though it results in the Condition C violation.

If this preference for an analysis without extraposition is real, then the analysis that posits movements of NP₁ and NP₂ in (56) would be ruled out on those grounds, especially since the Croatian counterpart of the sentence in (57), given in (59), is also ungrammatical.

59. ??Dala sam mu_j knjigu koja se Ivanu_j sviđala jučer.

Gave.1SG *Aux* him book which REFL Ivan.DAT pleased yesterday

‘I gave him_j a book that Ivan_j liked yesterday.’

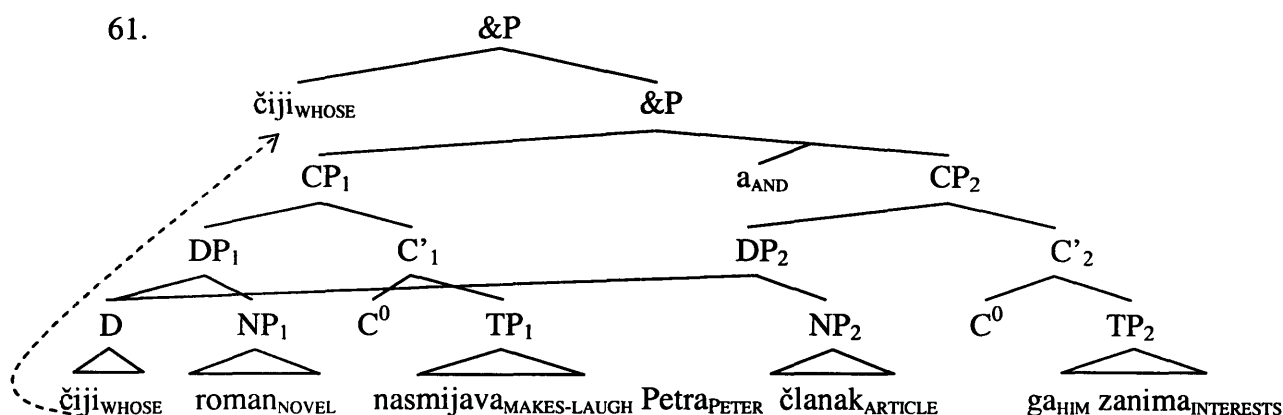
Now, given that Croatian sentence in (54) is grammatical, the other movement, the leftwards movement of the wh-phrase *whose* must have happened. This is not surprising, since Croatian allows Left-Branch extraction (LBE). Let us first consider (60). In contrast to (53), Croatian example in (60) is well-formed.

60. Čiji je Marija rekla da roman zabavlja Petra?

Whose *Aux* Marija said that novel entertains Petar

‘Whose novel did Marija say entertains Petar?’

What (60) tells us is that it is independently possible to extract the wh-phrase *čiji* (‘whose’) away from the NP *roman* (‘novel’). This movement, should then also be allowed in (54). This possibility is illustrated in (61).



Thus, the proposal in this dissertation seems to correctly rule out instances of LNR in which the shared material may not move leftwards regardless of sharing. LNR structures are well-formed only if the shared material may independently undergo leftwards movement in a particular language.

6. Conclusion

In this chapter we saw that my proposal that sharing is constrained by COSH allows for ATB questions, RNR and gapping to be sharing configurations.⁷¹ The analysis of ATB questions that is compatible with COSH involves TP coordination with a single C^0 head in the structure. If conjuncts are taken to be the size of CPs, the structure is ruled out by COSH. We saw that COSH (or my principles of linearization) makes no definite predictions about RNR – it may turn out that RNR is a movement operation or a non-movement operation, or perhaps that it is structurally ambiguous between the two. Finally, we saw that gapping may be derived by sharing, but only if

⁷¹ I omitted the discussion of free relatives (FRs), for the following reasons. Assuming Citko's (2000) analysis of FRs, the discussion here would basically replicate the discussion of ATB questions. According to this proposal, the shared wh-phrase moves to a position comparable to the landing site of the wh-phrase in an ATB question, which makes the structure obey COSH (linearizable). Van Riemsdijk's (2006) analysis violates COSH and is also not linearizable by my linearization algorithm, but his representation of a FR involves two root nodes in a tree, which is more generally incompatible with the proposed theory.

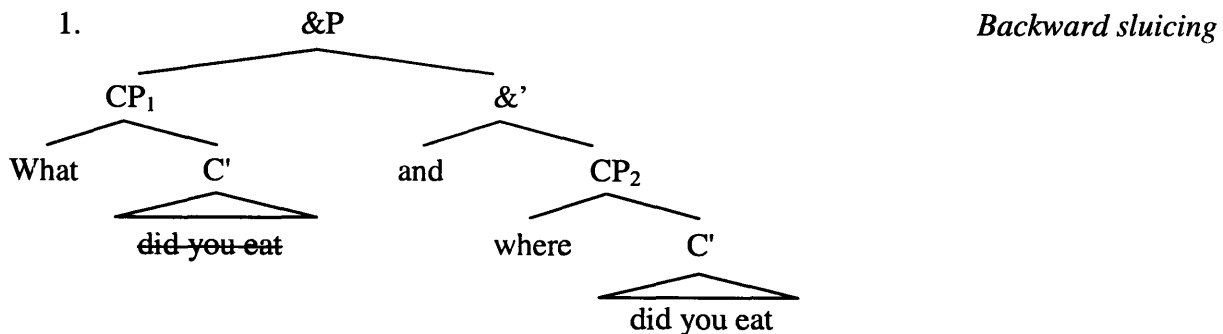
a particular configuration is posited (Johnson 2000, 2004). There are, however, important differences between gapping and other structures that involve non-bulk sharing, namely BMWs, which might be an indication that independent factors are at play in the derivation of a gapping sentence. Finally, I addressed the question of LNR. I concluded that LNR is possible, to the extent that the shared material merged at the left edge of the sentence is independently allowed to undergo leftward movement.

Chapter 5: Plausible alternatives

1. Introduction

In Chapter 2 I argued that *Wh&Wh*'s in English obligatorily involve clausal coordination, i.e. that they are derived from a BMW. We saw arguments that some *Wh&Wh*'s in Croatian with repeated clitics, also must be BMWs.⁷² I argued that the correct analysis of BMWs in both English and Croatian involves non-bulk sharing of individual terminals between the two coordinated clauses.

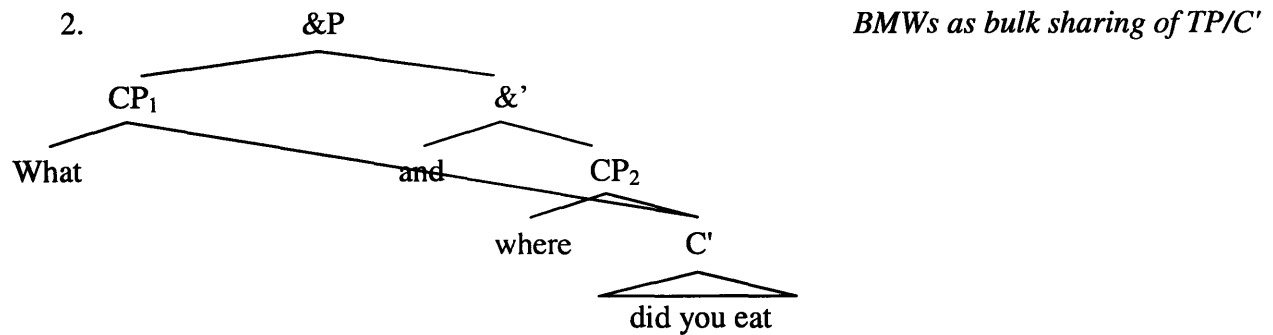
In this chapter I will consider alternative analyses for BMWs. Some of them have been proposed in the literature, and some have not. The analysis that *has* been proposed in the literature involves clausal coordination with sluicing of the TP (or C') in the first conjunct (proposed by Browne (1972) for Serbo-Croatian and Bánréti (1992) for Hungarian). This analysis is represented in (1). I refer to it as *the backwards sluicing analysis*.



Other possible analyses that to my knowledge have *not* been proposed in the literature are those that derive BMWs through MD. These fall into two plausible categories: the first category

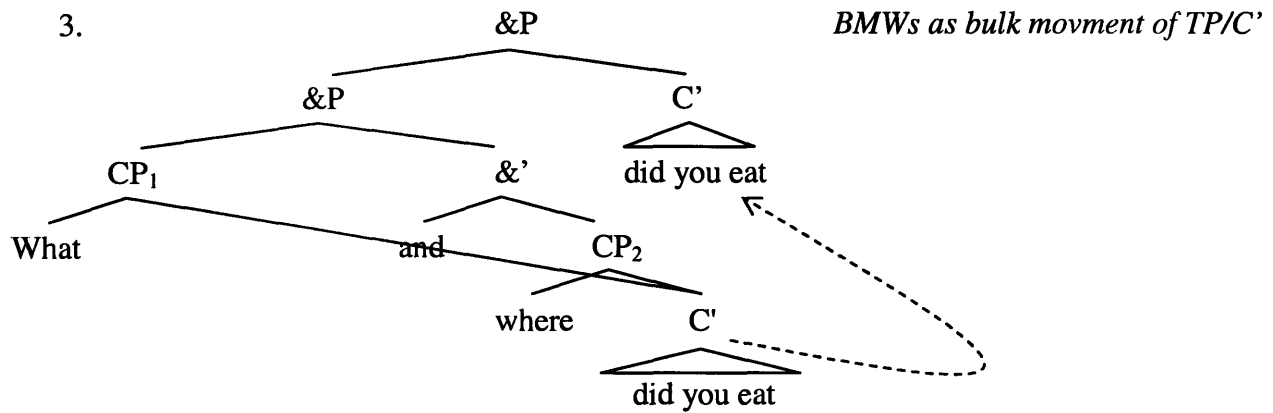
⁷² In Chapter 6 I will discuss Croatian CMWs that do not involve clausal coordination.

involves an analysis according to which the TP or C' in a BMW is *bulk shared* between the conjuncts. In one variant of this analysis, the bulk shared constituent is allowed to remain *in situ* (analogous to a non-moving analysis of RNR, proposed by McCawley 1982, McCloskey 1986, Wilder 1999 and Bachrach & Katzir 2006, among others). I will call this analysis *the bulk-sharing analysis*. It is illustrated in (2).



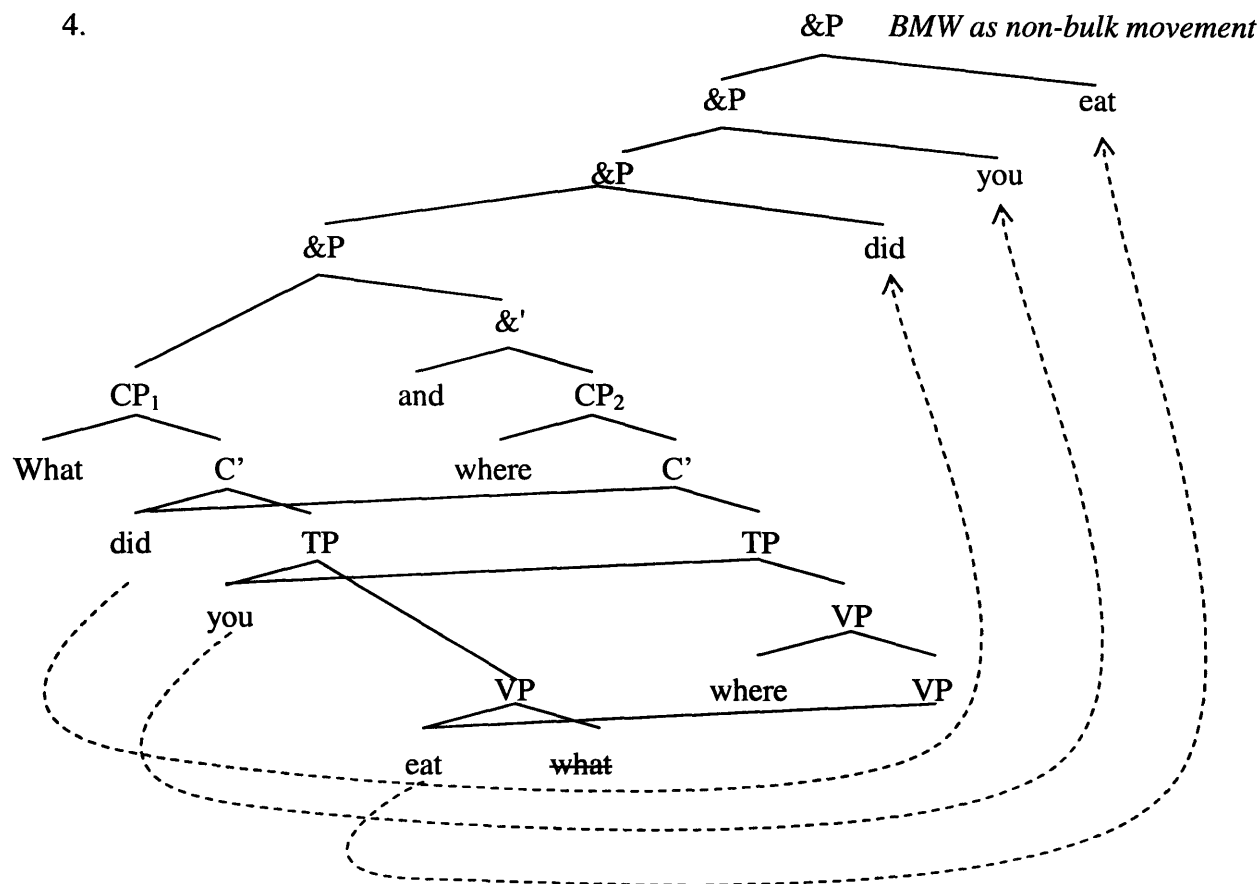
Another variant of the bulk sharing analysis I would like to address involves an additional rightwards movement of the shared constituent (analogous to a moving analysis of RNR, proposed by Postal 1998, Sabbagh in press, among others). This analysis, represented in (3), I will refer to as *the bulk movement analysis*.⁷³

⁷³ An assumption made here is that two syntactic objects cannot be collapsed into one. Therefore, ATB movement always involves shared material.



Finally, an analysis that also has to be considered is one that involves MD of individual terminal nodes, but requires that they all move rightwards, independently of one another. Such an analysis shares with the analysis in (3) the requirement that the shared material move to the right, and it shares with the proposed analysis the fact that it views shared material as being non-bulk shared. I call this possibility the *non-bulk movement* analysis. It is represented in (4).

4.



The chapter is organized as follows: in section 2 I argue against the analysis represented in (1), which involves sluicing of the TP in the first conjunct. In sections 3 and 4, I review and refute the two analyses represented in (2) and (3), which require some notion of ‘bulk’ sharing. Finally, in section 5, I consider non-bulk movement, illustrated in (4), as a possible analysis of a BMW. Section 6 contains concluding remarks.

2. *Against backwards sluicing in a BMW*

In this section I will present arguments that backward sluicing is not an appropriate analysis of BMWs.⁷⁴ I will show that, even though backward sluicing is in principle possible in both English and Croatian, it is not the case that BMWs in these two languages are derived through the deletion of the TP in the first conjunct. Let us first take a look at English.

2.1. *Against backward sluicing in English BMWs*

English allows backwards sluicing, as is shown by (5) and (6).

5. I don't know what, but John will have something. (Coppock, 2001)

6. I don't know who, but I am sure she is dating somebody. (Romero, 1998)

Examples (5) and (6) show that deleting a TP in a sentence where the antecedent TP *follows* the deleted one in the linear order is in principle allowed in the language. One might then think that in a BMW, the same operation is taking place. i.e. that a BMW in (7)a involves the underlying representation in (7)b, with sluicing of the TP/C' in the first conjunct. Here I argue that this is not the case.

7. a. What and where did you eat.

b. What did you eat

⁷⁴ Throughout the chapter, I refer to sluicing as a PF deletion operation, in the sense of Merchant (2001). However, arguments presented here are independent of a particular view of sluicing.

The argument that I present against a sluicing analysis of BMWs relies crucially on the fact that the kind of sluicing that would be required for the derivation of a BMW is the so-called ‘antecedentless sluicing’ (AS). Consider examples in (8). In (8)a the sluiced wh-phrase, *what*, has an overt antecedent in the pronounced clause, namely the indefinite *something*. In (8)b, however, this is not the case – the antecedent of *what* is the implicit argument of the verb *eat*.

8. a. John ate something, but I don’t know what.
 b. John ate, but I don’t know what.

Both (8)a and (8)b are grammatical, showing that AS is possible in English. Moreover, AS is also possible in backwards sluicing, as shown in (9).⁷⁵

9. ?I don’t remember what <John was eating>, but I am sure that John was eating.

Recall that BMWs are interesting (and informative) precisely because the verbs that they contain are interpreted transitively in the first conjunct and intransitively in the second. Thus, if the TP in the first conjunct is sluiced, it follows that the antecedent for the sluiced wh-phrase *what* is an implicit argument, as shown in (7).

⁷⁵ Some speakers find (9) degraded in comparison to (i), (ii) and (iii). If the degradation of (9) is sufficient to rule out backwards AS in English, that in itself constitutes an argument against backwards sluicing analysis of BMWs. The argument that follows in the main text is relevant if speakers find (9) degraded, but still acceptable.

- | | | |
|-------|-----------------------------------------------------------------|-------------------------------------------------------|
| (i) | I am sure John was eating, but I can’t remember what. | <i>Forward AS</i> |
| (ii) | I can’t remember what, but I am sure John was eating something. | <i>Backward sluicing
with an overt antecedent</i> |
| (iii) | I can’t remember why, but I know John was eating. | <i>Backward AS
with an implicit adjunct</i> |

In what follows, we will see that BMWs do not possess the properties that AS induces. In particular, we will see that some instances of *bona fide* AS are ungrammatical, while the comparable BMWs are well-formed.

It has been noted by Chung, Ladusaw and McCloskey (1995), henceforth CLM, that AS does not have the exact same characteristics that the sluicing with an overt antecedent does. In particular, CLM observe that while the latter has the property of being insensitive to islands, the former does not.⁷⁶ Thus, while (10)a is grammatical, (10)b is not. In (10)a, the implicit argument of the verb *win* can serve as an antecedent for the wh-phrase *which race* in the sluiced clause. However, when the implicit argument is embedded in the subject island, the sluice is no longer possible.

10. a. It is likely that Tom will win, but it's not clear which race. (CLM, ex. (102d), pg. 279)

b. *That Tom will win is likely, but it's not clear which race. (CLM, ex. (102c), pg. 279)

The violation in (10)b is at least as severe as it is in its overt counterpart, given in (11).

11. *It's not clear which race that Tom will win is likely.

Romero (1998) points out that AS is blocked not only by strong islands, but also by the intervention of other operators. She notes that examples like those in (12)a and (13)a are ungrammatical, even though their overt counterparts in b) are well-formed.

⁷⁶ CLM attribute this observation to Chris Albert.

12. a. *Few kids ate, but I don't know what ~~<few kids ate>~~. (Romero 1998, ex. (96c), pg. 59)

b. I don't know what few kids ate. (Romero 1998, ex. (96'c), pg. 60)

13. a. *Joan rarely fed my fish, but I don't know with which product ~~<Joan rarely fed my fish>~~. (Romero 1998, ex. (96d), pg. 59)

b. I don't know with which product Joan rarely fed my fish. (Romero 1998, ex. (96'c), pg. 60)

Romero argues that the ungrammaticality of the (a) examples in (12) and (13) is due to the violation of Scope Parallelism. Scope parallelism requires that the remnant of a deletion operation and its antecedent have the same scope. The requirement is given in (14).

14. *Scope Parallelism*

The focused remnant and its antecedent must have parallel scope.

The reason why sluices in (12) and (13) are unacceptable, she argues, is the fact that an implicit argument, as noted by Fodor & Fodor (1980), always takes the narrowest scope in its clause. Scope parallelism then requires that the sluiced wh-phrase, *what*, also take the narrowest scope in its clause. It is important to point out that the relevant notion of scope here is the one relative to other operators in the clause, and not the one tied to a particular position in the structure. In other words, it is not the case that the antecedent (the implicit argument) and the remnant (the sluiced wh-phrase) must take scope at the exact same level in the clause. This is always impossible, given that the sluiced wh-phrase always takes scope at the CP-level, quite

higher than the implicit argument. Instead, Scope parallelism is satisfied *as long as the wh-phrase does not take scope higher than some other operator in the clause*. Given that the wh-phrase always takes scope in its surface position, this is only true if the sluiced clause contains no other operators that the wh-phrase must outscope (those that obligatorily take narrow scope with respect to wh-phrases).⁷⁷ Sluices in (12) and (13) contain additional operators that the wh-phrase obligatorily outscores (*few kids* and *rarely* respectively). That these operators cannot take scope over the wh-phrase is shown in (15) and (16). In both sentences, the c) reading is not present, showing that *what* must outscope *few kids* and *rarely* respectively.

15. a. What did few kids eat?

b. What > few kids: What is the thing x, such that few kids ate x?

c. *Few kids > what: For few kids y, tell me what y ate.

16. a. What did John rarely read?

b. What > rarely: What is the thing x, such that John rarely read x.

c. *Rarely > what: On rare occasions y that John was reading, what did he read on occasions y.

In (12)a and (13)a, the wh-phrase, *what* in the sluiced clause necessarily scopes higher than *few kids* and *rarely* respectively, but in the antecedent clause, the implicit argument, which is an antecedent of *what*, scopes lower than these operators. Therefore, Scope parallelism is not

⁷⁷ Romero (1998) claims that 'AS succeeds ...only if there is no operator whatsoever under C⁰ at LF' (pg. 63). This means that AS should be bad even those operators that allow a pair-list reading in a wh-question, such as *everyone*. For our purposes, it is sufficient to show that there is a difference in grammaticality between *bona fide* AS sluicing and BMWs when they involve operators that obligatorily scope under the wh-phrase.

satisfied: the wh-phrase does not take the narrowest scope in its clause, but its antecedent (the implicit argument) does.

What does this mean for the derivation of BMWs? Well, the predictions of the sluicing account are clear: if BMWs are derived by AS, they should be bad if the pronounced antecedent clause contains an operator such as *few* or *rarely*, for the same reasons for which (12) and (13) are ungrammatical. The sharing account that I have been arguing for, on the other hand, predicts that those BMWs that contain operators other than wh-phrases should be good. The following data show that the prediction of the sharing account is borne out: BMWs in (17) – (18) are grammatical regardless of the fact that they contain operators that are outscoped by the wh-phrase *what*.

17. What and where does Peter rarely eat?

18. [?]What and how did few professors teach?

Since the sluicing account predicts that BMWs in (17) – (18) should be bad, contrary to fact, I conclude that sluicing cannot be the correct analysis of these structures.

Another argument against backwards sluicing in English BMWs comes from *swiping* (Ross 1969, Van Riemsdijk (1978), Chung et al. (1995), Merchant (2001, 2002)). Swiping (Sluiced Wh-word Inversion with Prepositions In Northern Germanic) is a term used to describe the possibility in English (and marginally in Danish and Norwegian) of a certain kinds of wh-phrases inside a prepositional phrase to ‘switch places’ with the preposition that heads the PP. This is *only* possible under sluicing. Swiping is illustrated in (19).

19. a. I know that Mary danced with someone, but I don't know **with who**.

b. I know that Mary danced with someone, but I don't know **who with**.

If the TP following the swiping site is not deleted, then swiping is ungrammatical:

20. a. I don't know **with who** Mary danced.

b. I don't know **who** Mary danced **with**.

c. *I don't know **who with** Mary danced.

Swiping is also allowed in backwards sluicing:

21. Although we don't know yet **who from**, we know she received a package last Monday
with instructions on bomb assembly. (Merchant 2002)

In a BMW, however, swiping is not allowed, as shown by (22)a and (22)b.

22. a. Mary doesn't know **with who** and why Bill danced.

b. *Mary doesn't know **who with** and why Bill danced.

Regardless of what the correct analysis of swiping is, if sluicing is what makes swiping possible, the fact that it is impossible in (22)b argues against backwards sluicing as the correct analysis of BMWs in English.

2.2. Against backward sluicing in Croatian BMWs

In the previous section we saw that one of the arguments against backward sluicing analysis of English BMWs comes from the fact that BMWs that contain operators such as *few kids* and *rarely* are grammatical, while the comparable AS examples are ill-formed. The argument extends straightforwardly to Croatian.

Instances of AS in (23) and (24) are ungrammatical.

23. *Znam da je Petar rijetko jeo, ali ne znam što.

Know-I that *Aux.cl* Petar rarely eaten but *Neg* know-I what
'I know that Petar rarely ate, but I don't know what.'

24. *Znam da je malo djece pjevalo, ali ne znam što.

Know-I that *Aux.cl* few kids sung but *Neg* know-I what
'I know that few kids sang, but I don't know what.'

Presumably the sluices in (23) and (24) are bad for the same reason for which their English counterparts in (12)a and (13)a are ungrammatical, namely the fact that the sluiced wh-phrase *što* ('what') takes scope over *rijetko* ('rarely') and *malo djece* ('few kids'). However, the BMWs in (25) and (26) are well-formed.

25. Što JE i zašto JE Petar rijetko jeo?

What *Aux.cl* and why *Aux.cl* Petar rarely eaten
'What and why did Petar rarely eat?'

26. Što JE i gdje JE malo djece pjevalo?

What *Aux.cl* and where *Aux.cl* few kids sung

‘What and where did few kids sing?’

Before we can conclude that backward sluicing is not an appropriate analysis for Croatian BMWs, we need to make sure that *rijetko* (‘rarely’) and *malo djece* (‘few kids’) display the same scopal behavior in wh-questions as their English counterparts do. This is shown in (27) and (28).

27. a. Što je Petar rijetko jeo?

What *Aux.cl* Petar rarely eaten

‘What did Petar rarely eat?’

b. *Što* (‘what’) > *rijetko* (‘rarely’): What is the thing x such that Petar rarely ate x.

c. **Rijetko* (‘rarely’) > *što* (‘what’): On the rare occasions y that Petar ate, what did he eat on y.

28. a. Što je malo djece pjevalo?

What *Aux.cl* few kids sung

‘What did few kids sing?’

b. *Što* (‘what’) > *malo djece* (‘few kids’): What is the thing x such that few kids sang x.

c. **Malo djece* (‘few kids’) > *što* (‘what’): For few kids x, tell me what x sang.

Now that we have convinced ourselves that in both English and Croatian *rarely* and *few kids* must take scope under the wh-phrase in a wh-question, we can conclude that the contrast

between (23) and (24) on the one hand and (25) and (26) on the other argues against backward sluicing analysis of BMWs.⁷⁸

The second argument that sluicing is not responsible for deriving the surface string in a Croatian BMW is restricted only to BMWs with repeated clitics. The argument takes the following form. We will first see that in Croatian, if the first constituent of a tensed clause is a wh-word/phrase, clitics must *immediately* follow that constituent. They cannot appear lower in the structure, which is sometimes allowed if the first constituent is not a wh-element. I will then show that Croatian allows backward sluicing. Finally, we will see that neither forward nor backward sluicing can strand clitics (Merchant, 2001, Richards, 2003). Given that in BMWs clitics ‘survive’, I conclude that sluicing is not the operation responsible for deriving the surface string in a BMW from underlyingly coordinated clauses.

Croatian clitics, as mentioned earlier, must appear in the second position in their clause. This is illustrated in (29).

29. a. Jan MI JE otvorio vrata.

Jan me.cl Aux.cl opened door

‘Jan opened the door for me.’

b. *Jan otvorio MI JE vrata.

Jan me.cl Aux.cl opened door

⁷⁸ This argument holds also for those BMWs in Croatian in which clitics are not repeated, as well as for those that do not contain clitics. I discuss those in Chapter 6.

However, if the first constituent is somewhat heavy, as in (30), clitics are allowed to occupy the third position in the clause.⁷⁹

30. a. Ova mala djevojčica MI JE otvorila vrata.

This little girl me.dat Aux.cl opened door

‘This little girl opened the door for me.’

b. Ova mala djevojčica otvorila MI JE vrata.

This little girl opened me.dat Aux.cl door

However, when the first constituent is a *wh*-element, clitics must follow that constituent, regardless of its heaviness. This is illustrated in (31) and (32).⁸⁰

31. a. Tko MI JE otvorio vrata?

Who me.cl Aux.cl opened door

‘Who opened the door for me?’

b. *Tko otvorio MI JE vrata?

Who opened me.cl Aux.cl door

⁷⁹ What exactly allows for examples like (30)b is unclear. For relevant discussion see Čavar & Wilder (1994). The exact nature of the phenomenon is irrelevant for our purposes.

⁸⁰ In both (30) and (32)b, clitics can ‘break up’ the first constituent, as in (i) and (ii). This possibility is orthogonal to the argument at hand.

(i) Ova MI JE mala djevojčica otvorila vrata.
This me.cl Aux.cl little girl opened door
‘This little girl opened the door for me.’

(ii) Koja MI JE mala djevojčica otvorila vrata?
Which me.cl Aux.cl little girl opened door
‘Which little girl opened the door for me?’

32. a. Koja mala djevojčica MI JE otvorila vrata?

Which little girl me.cl Aux.cl opened door

‘Which little girl opened the door for me?’

b. *Koja mala djevojčica otvorila MI JE vrata?

Which little girl opened me.cl Aux.cl door

Examples (31)b and (32)b show that clitics must immediately follow the wh-phrase if the wh-phrase is the first constituent in the clause. This means that a string in (33) cannot be derived by, for example moving an element X between the wh-phrase and clitics, followed by the deletion of X.

33. a. wh...clitics

b. *wh X clitics X

\nwarrow _____

Now that we have established that Croatian clitics must be adjacent to the wh-element, let us take a look at how backward sluicing works in the language.

Like English, Croatian allows instances of both forward and backward sluicing. This is shown in (34).

34. a. Jan zna da MU JE Ivan nešto kupio, ali ne zna što.

Jan knows that him.cl Aux.cl Ivan something bought but Neg knows what

‘Jan knows that Ivan bought him something, but he doesn’t know what.’

b. Jan ne zna što, ali zna da MU JE Ivan nešto kupio.

Jan *Neg* knows what but knows that him.cl Aux.cl Ivan something bought

‘Jan doesn’t know what, but he knows that Ivan bought him something.’

However, deleting a TP to the right of (a) clitic(s) is not allowed in neither forward nor backward sluicing.

35. a. *Jan zna da MU JE Ivan nešto kupio, ali ne zna što MU JE.

Jan knows that him.cl Aux.cl Ivan something bought but *Neg* knows what him.cl Aux.cl

‘Jan knows that Ivan bought him something, but he doesn’t know what.’

b. *Jan ne zna što MU JE, ali zna da MU JE Ivan nešto kupio.

Jan *Neg* knows what him.cl Aux.cl but knows that him.cl Aux.cl Ivan something bought

‘Jan doesn’t know what, but he knows that Ivan bought him something.’

One might think that the ill-formedness of (35)a and (35)b is due to the fact that clitics occupy the last pronounced position in the(ir) clause. However, a VP-ellipsis example in (36) shows that there is in principle nothing wrong with deleting the string adjacent to the clitic(s), as long as that string is not a TP.

36. Petar MU JE pokazao put, a i Jan MU JE <pokazao put>.

Petar him.cl Aux.cl shown way and also Jan him.cl Aux.cl shown way

‘Petar showed him the way and Jan did too.’

It is also not true that clitic stranding under sluicing is bad only if the clitics are *immediately* adjacent to the elided TP. Consider (37). In (37)b, the TP in the embedded clause is sluiced together with the clitics, and the sentence is grammatical. In (37)c, on the other hand, the clitics are placed inside the first constituent of its clause (see footnote 80 for this placement of clitics). Still, once the TP is sluiced without eliding the clitics, the sentence is ungrammatical, even though the clitics are not immediately adjacent to the deleted TP.

37. a. Znam da MU JE Dan tu negdje pokazao pištolj, ali ne znam na
 Know-I that him.cl Aux.cl Dan here somewhere shown gun but not know-I on
 kojem MU JE uglu Dan pokazao pištolj.
 which him.cl Aux.cl corner Dan shown gun
 ‘I know Dan showed him the gun somewhere around here, but I don’t know on which
 corner Dan showed him the gun.’
- b. Znam da MU JE Dan tu negdje pokazao pištolj, ali ne znam na
 Know-I that him.cl Aux.cl Dan here somewhere shown gun but not know-I on
 kojem uglu.
 which corner
 ‘I know Dan showed him the gun somewhere around here, but I don’t know on which
 corner.’
- c. *Znam da MU JE Dan tu negdje pokazao pištolj, ali ne znam na
 Know-I that him.cl Aux.cl Dan here somewhere shown gun but not know-I on
 kojem MU JE uglu.
 which him.cl Aux.cl corner

Given the grammaticality of (36), and the ungrammaticality of (37)c, the correct generalization of the facts seems to be that sluicing (understood as the deletion of the TP that follows the surviving wh-phrase) may not strand clitics, even though other types of deletion processes may.⁸¹

Recall that Croatian BMWs we have so far been considering in this dissertation involve examples in which clitics follow each wh-phrase, as in (38) below.

38. Gdje MU JE i kada MU JE Petar pokazao novac?

Where him.cl Aux.cl and when him.cl Aux.cl Petar showed money

‘Where and when did Petar show him the money?’

If a deletion operation is responsible for deriving (38), the fact that (besides clitics) only the wh-phrase survives the deletion tells us that what has been deleted is a TP (possibly a C’), and nothing smaller than that, i.e. it tells us that the operation in question should be sluicing, and not for example VP-ellipsis.⁸² On the other hand, we know from examples like (35) that clitic-

⁸¹ Merchant (2001) captures this fact by his Sluicing-COMP generalization:

- (i) Sluicing-COMP generalization
In sluicing, no non-operator material may appear in COMP.

⁸² Note that nothing is gained by positing the structure in (i), in which the subject remains within the vP, thus opening up a possibility that what is deleted is in fact a vP.

- (i) [_{CP} Gdje MU JE [_{VP} ~~Petar pokazao novac~~] i kada MU JE [_{VP} Petar pokazao novac]]
where him.cl Aux.cl Petar showed money and when him.cl Aux.cl Petar showed money
‘Where and when did Peter show him the money?’

If such a representation were possible, we would have to explain why it cannot be posited for simple cases of sluicing, as in (35)a, which would then have the structure in (ii).

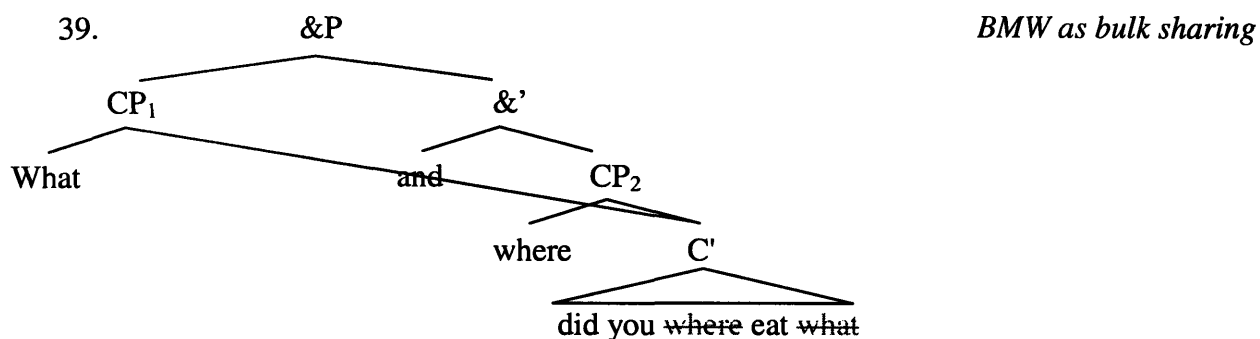
stranding is not allowed under sluicing. Thus, I conclude that BMWs in Croatian are not derived through the deletion of the TP in the first conjunct, i.e. that backward sluicing analysis is not correct for BMWs in Croatian.

In the next two sections, we will see that BMWs are also not derived by bulk sharing of the TP between the two conjuncts.

3. *Against bulk-sharing in a BMW...*

I showed in the previous section that a deletion analysis does not seem to be correct for the derivation of BMWs neither in English nor in Croatian. If this argument is successful, it is hard to imagine an analysis that can derive the surface string in a BMW by positing two *distinct*, but (structurally and/or phonologically) identical TPs. In other words, if we find ourselves convinced by the arguments presented in the previous section, that no operation of deletion is responsible for reducing two underlyingly present TPs to one, it is hard to see what other analysis might be able to do so. An obvious alternative is to treat the TP that is pronounced as being *the only TP* in the structure. However, the meaning that a BMW has (see sections 2.3 and 3.2. of Chapter 2 for English and Croatian respectively) indicates that the TP is interpreted twice, once in each conjunct. This means that it has to simultaneously be part of both CP₁ and CP₂, i.e. that it must be shared between the two. The seemingly simplest representation of this possibility is given in (2), repeated here as (39).

-
- (ii) *Jan zna [CP da mu je [vP Ivan nešto kupio]], ali ne zna
 Jan knows that him.cl Aux.cl Ivan something bought but not knows
 [CP što mu je [vP ~~Ivan kupio~~]].
 what him.cl Aux.cl
 'Jan knows that Ivan bought something for him, but he doesn't know what.'



However, in Chapter 2 we saw evidence that these constructions behave as if each conjunct contained only one wh-phrase. Assuming that wh-phrases *what* and *where* are externally merged within the TP/C' and subsequently move to their surface positions, the material under the shared node, C' in (39), would have to contain traces/copies/occurrences of both.⁸³ This means that CP₁ and CP₂ would form the following two sets (an element whose highest copy is outside of the set is shaded):

40. CP₁: {what, did, you, where, eat}

CP₂: {where, did, you, eat, what}

This representation raises a number of problems. First, under the view that re-merge of an element to a higher position forces the lower copy to be interpreted as a variable, the shaded elements in the sets in (40) would after the re-merge have to be interpreted as variables. However, if the structure in (39) is correct, the higher copy of *where* is no longer part of the set that is CP₁. This means that *within* CP₁ the variable left by the re-merge of *where* to a higher position is unbound. Similarly, the lower copy of *what* is not bound within CP₂. Thus, even

⁸³ In the rest of the chapter, for expository reasons, I will be using the terms 'copy' or 'trace' to refer to the lower occurrence of an element that is remerged in a higher position.

though *within the &P* both wh-phrases are bound by their respective antecedents, *in each of the conjuncts* this is not the case. Under the assumption that semantics is read off of syntax and that material in a syntactic tree cannot be ignored for purposes of interpretation, there would have to exist a way either to bind the unbound variables by a different operator, one that *is* present in each CP, or else to treat them as *free* variables, which would, as far as I can tell, give the same result.⁸⁴

3.1. Binding unbound traces of wh-phrases by another operator

Suppose that, under the analysis in (39), unbound copies of wh-phrases in a BMW may be bound by an operator other than the wh-phrase that moved. Let us first consider what properties this operator would have to possess in order for the meaning of the BMW containing a variable bound by it to come out right. Consider again the BMW in (39), repeated below as (41).

41. What and where did you eat?

The sentence does not have the *it*-reading, but only the *at-all*-reading. So far, I have been paraphrasing this reading as (42)a. However, the reading in (42)a is compatible with the one in (42)b. In fact, (42)b is entailed by (42)a (Bresnan 1978, Fodor & Fodor 1980, Mittwoch 1982).

42. a. What did you eat and where did you eat at all?

b. What did you eat *somewhere* and where did you eat *something*?

⁸⁴ I am grateful to Tamina Stevenson (p.c.) for pointing out this possibility.

Given this, the operator that supposedly binds the trace of *what* in the second conjunct must be capable of giving it existential reading. Similarly, the trace of *where* in the first conjunct would have to be interpreted as *somewhere*. So, it seems that if the unbound wh-trace in each conjunct somehow ends up being bound, it must be bound by some sort of an existential quantifier. An obvious first choice is existential closure, proposed by Kamp (1981) and Heim (1982). However, this cannot be quite right, because existential closure is an implicit existential quantifier that is freely available in *all* sentences that contain otherwise unbound indefinites. In our case, the existential quantifier must be lexically restricted to a particular class of verbs, namely those that are optionally transitive.⁸⁵ So, if (39) is the correct representation of the CMW in (41), it must be true that optionally transitive verbs, such as *eat*, *sing*, *read*, *etc.* inherently contain an existential quantifier that is capable of binding the unbound trace of the wh-object in a BMW. Alternatively, they must be capable of somehow licensing an insertion at LF of such an existential quantifier. In what follows, I call this quantifier \exists_{EAT} . However, a proposal that the only use of \exists_{EAT} is to save the representation in (39) from containing an unbound variable would be *ad hoc* and therefore unwarranted. So, if it is true that optionally transitive verbs indeed do come equipped with \exists_{EAT} (however this idea is implemented), we would want this quantifier to be able to perform other tasks, perhaps more ordinary ones than binding the unbound trace of the wh-object that moved out of the set where the trace needs to be bound, as is the case in a BMW. Binding implicit arguments of optionally transitive verbs is such a task.

Indeed, it has been proposed in the literature that implicit arguments are ‘intrinsic variables’ bound by existential quantifiers inserted at LF (Johnson 2001). If optionally transitive

⁸⁵ Note that existential closure in the sense of Kamp-Heim theory still might be what binds the unbound trace of the wh-adjunct in the first conjunct, in our case *where*. Given this fact, in the rest of the argument against bulk sharing analysis of BMWs I will make reference only to the trace of the wh-object, since existential closure does not seem to be a possible choice there.

verbs *always* make available the use of \exists_{EAT} , because it is needed in order to bind implicit arguments of such verbs, then the proposal under consideration here, that bulk sharing is the correct analysis of BMWs, must be taken seriously.

To sum up the discussion so far: I have evaluated the possibility that optionally transitive verbs in a BMW somehow allow the wh-trace of the moved object to be bound by an existential quantifier (\exists_{EAT}) that such verbs have at their disposal. We noted that from the conceptual point of view, positing such a quantifier in a BMW is only warranted if it can be shown that it is available to this class of verbs in other syntactic environments as well. We hypothesized, following Johnson (2001), that this is indeed true, i.e. that implicit arguments of optionally transitive verbs are *always* bound by \exists_{EAT} .

Here, I will present an argument that this view of optionally transitive verbs is not correct. Evidence against it comes from sluicing examples of the sort given in (43). In (43), the TP that provides an antecedent for the sluice, *IBM did t_{WHAT}*, contains an A'-trace that is apparently absent from the sluiced TP. For ease of exposition, I will refer to this kind of sluicing as *trace-sluicing*.

43. The report details what IBM did and why. (Merchant 2001, ex. (112b), pg. 201)

Merchant (2001) explains the well-formedness of trace-sluices like (43) by noting that (43) 'has the interpretation parallel to the sentence in (44), which contains an overt pronoun anaphoric to preceding non-c-commanding wh-phrase' (pg. 203).

44. The report details what₁ IBM did and why IBM did it₁.

This observation leads him to adopt Fiengo and May's (1994) mechanism of 'vehicle change', according to which non-pronominals may be treated as pronominals under ellipsis. In particular, Merchant proposes that a variable like a *wh*-trace may be treated as a pronominal under deletion.

For our purposes, the exact mechanism of how the meaning of (43) is computed is somewhat orthogonal to the problem. What we are interested in are those examples of trace-slucing that contain an optionally transitive verb, such as that in (45).

45. I know what Peter eats in the morning, I just don't know why.

Note first that (45) does not have the reading in which the verb in the sluiced clause is treated as having an implicit argument. In other words, (45) only has the reading in (46)a, and not that in (46)b.

46. a. I know what Peter eats in the morning, I just don't know why he eats *it/that* in the morning.

b. # I know what Peter eats in the morning, I just don't know why he eats in the morning.

The judgment that the reading in (46)b is absent becomes sharper in the following scenario:

47. Scenario 1:

Peter once told me that he eats croissants in the morning because they are not too heavy and they taste just wonderful with his breakfast tea. I also know that he *always* eats in the morning, although I have no idea why: I try to avoid discussions about healthy eating

habits (I myself only have coffee in the morning). Anyway, when Peter is staying with me, I try to make him happy and I always give him a croissant for breakfast, ‘cause, you see, I know what Peter eats in the morning, I just don’t know why.

Speakers I consulted find the underlined part in (47) above, which corresponds to (45), false in the context. The sluice is interpreted as contradicting the previous statement, that I *know* why Peter eats croissants in the morning. Note that the contradiction is only predicted if the sluiced clause is interpreted to mean: *I don’t know why Peter eats them in the morning.* I take this judgment to mean that the TP which serves as the antecedent for the sluice must contain the trace of the wh-phrase *what*.⁸⁶

Let us now consider the implications of this conclusion for the proposal I am arguing against here, namely that optionally transitive verbs introduce into the structure the existential quantifier \exists_{EAT} that can bind unbound variables in the clause. As far as I can tell, under this proposal, the sentence in (45) uttered in the context given in (47) should also have the reading that is judged as absent. This is because the sluiced clause would have the structure in (48)a, and

⁸⁶ Note that I am not necessarily claiming that that Merchant’s ‘vehicle change’ explanation is correct because of the fact that the sluice in (45) is interpreted as containing a pronoun anaphoric to the wh-phrase in the antecedent clause. In fact, it might be that the sluice contains a copy of *what* and that the sluice is interpreted as a multiple question, *Why he eats what in the morning.* Given that the pairing of *what* and *why* is *known* to the speaker (namely that Peter eats croissants in the morning because they are not too heavy etc.), the sentence is interpreted as false in the context (I am grateful to Irene Heim (p.c.) for pointing out this option). This view is in keeping with other data from the interpretation of sluicing. For example, the sluice in (i) is judged as appropriate in the context where John knows that Peter eats dishes X, Y and Z and that he eats in restaurants A, B and C, but John doesn’t know the correct pairing of the dishes and restaurants. (i) has the reading given in (ii).

- (i) John knows what Peter eats, but he doesn’t know where.
- (ii) John knows what Peter eats, but he doesn’t know where he eats *it/them*.

However, an analysis of how the multiple question in the sluice is processed such that it yields the interpretation in (ii) is beyond the scope of this work. Therefore, I leave the problem of how trace-sluicing is interpreted for future research.

\exists_{EAT} should then be able to ‘catch’ the trace of *what* and give it existential interpretation, given in (48)b.

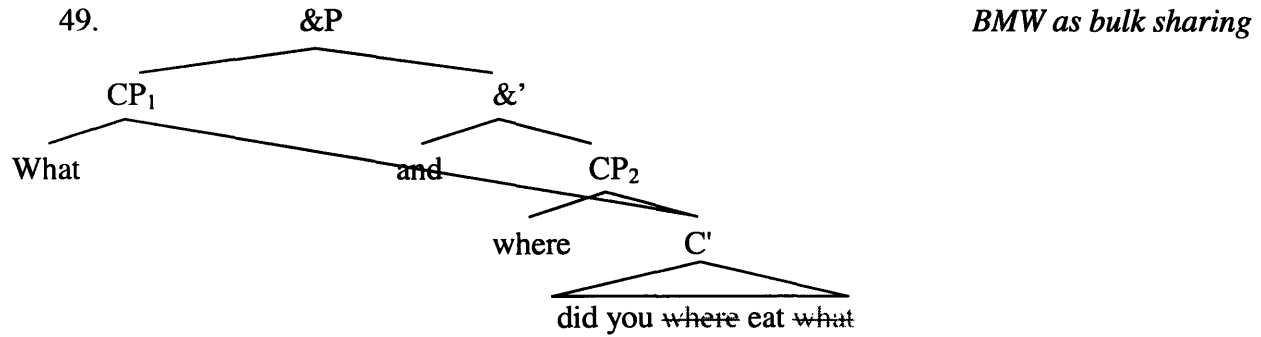
48. a. I know what Peter eats in the morning, I just don’t know why <Peter \exists_{EAT} eats t_{WHAT} in the morning>.

b. I know what Peter eats in the morning, I just don’t know why Peter eats *something* in the morning.

Since the reading in (48)b is entailed by the reading in (46)b, and the reading in (46)b is absent, then the reading in (48)b must also be absent. Since this reading is predicted on the account where \exists_{EAT} can bind an unbound wh-trace, I conclude that this account cannot be correct.

Whether it is still correct to treat implicit arguments of optionally transitive verbs as variables bound by \exists_{EAT} is a separate question. If \exists_{EAT} cannot bind the unbound trace of the moved wh-phrase in sluicing, it seems clear that it should not be able to do so in a BMW.

An objection might be raised that the two situations are not exactly the same, namely, that in a sluice the whole structure where the ‘uncanonical’ binding takes place is ultimately deleted, while in a BMW the structure is shared, but not deleted. The representation of a BMW under the bulk sharing hypothesis is repeated below for convenience.



In particular, one might suggest that binding in the sluice fails because sluicing is in fact LF-copying and not PF-deletion: given that in the antecedent clause the verb *eat* is transitive, the quantifier, \exists_{EAT} is not needed, and therefore not present. When the antecedent clause is copied in the sluice, this fact does not change.⁸⁷ However, this argument, although it looks appealing, cannot be used to differentiate between the situation in (48)a and that in (49). More precisely, if LF-copying of the verb *eat* into the sluice, as might be the case in (48)a, forces the two copies to be identical with respect to the availability of \exists_{EAT} , we would definitely expect that *sharing* of the verb *eat* forces the same identity. However, in (49), under this instantiation of the bulk sharing account, this is not the case. (Recall that the interpretation of CP₁ in (49) is *What did you eat*, while the interpretation of CP₂ is *Where did you eat*, and not *Where did you eat it*.)

Given the discussion in this section, it seems to me that there are good empirical arguments not to analyze BMWs as involving a TP/C' as being bulk-shared between the conjuncts.

⁸⁷ On the view that \exists_{EAT} is an inherent part of an optionally transitive verb, it is clear how LF-copying account of sluicing might explain the absence of reading in (48)b. On the view that optionally transitive verbs differ from obligatorily transitive ones in that they can *license* the insertion of \exists_{EAT} at the level of LF, a proponent of the LF-copying account would presumably argue that this is only licensed for those instances of optionally transitive verbs that surface without an overt object. Since the verb in the antecedent clause has an overt object, its copy in the sluiced clause cannot license \exists_{EAT} .

4. ...And against its subsequent ATB movement to the right

The arguments presented in the previous section show that positing a TP/C' that is totally shared between the two conjuncts in a BMW leads to several wrong predictions. All of these incorrect predictions carry over to another possible analysis of BMWs: rightward ATB movement of the TP/C'. Ross (1967) proposed ATB movement as a way of allowing violations of CSC: movement out of a coordinate structure is allowed if it proceeds from both conjuncts simultaneously. Citko (2005) argues that ATB movement requires more than just a parallelism constraint that both conjuncts contain a gap in the same position. She points out that if this were the case, examples like (50) would be grammatical, contrary to fact.

50. *Tell me who_i who_j Mary loves t_i and John hates t_j.

There is a possibility that (50) is ruled out in English on the grounds that the language independently does not have multiple wh-movement. However, the same is true in Polish, which otherwise allows multiple wh-fronting.

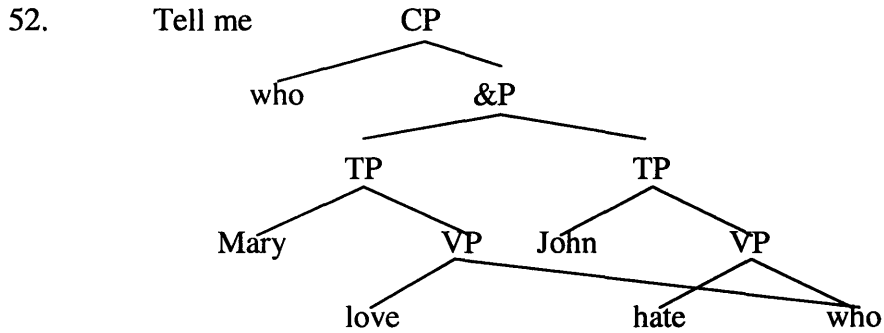
51. Kogo_i kogo_j Jan lubi t_i a Maria kocha t_j?

Citko (2005) ex. 37, pg. 492

Who who Jan likes and Maria loves

'Whom does Jan like and Maria love'

Citko argues that examples like (50) and (51) are ungrammatical because the pre-movement structure only contains one occurrence of the wh-phrase, which is shared between the conjuncts. This is illustrated in (52).



Assuming that Citko (2005) is correct in claiming that what ATB movement does is in fact move from both conjuncts the material that is dominated by both of them, the same would have to be true of the cases of rightward ATB movement that we are considering here as a possible analysis of BMWs. In other words, in (53), the underlined piece of structure would have to be what is moved from both conjuncts.

53. What and where did you eat?

Under the standard assumption that movement affects only constituents, the underlined string would have to be a constituent. Since C' is not a constituent to the exclusion of the lower copies of wh-phrases, the ATB movement proposal makes all the incorrect predictions discussed in the previous section that the bulk sharing proposal does.

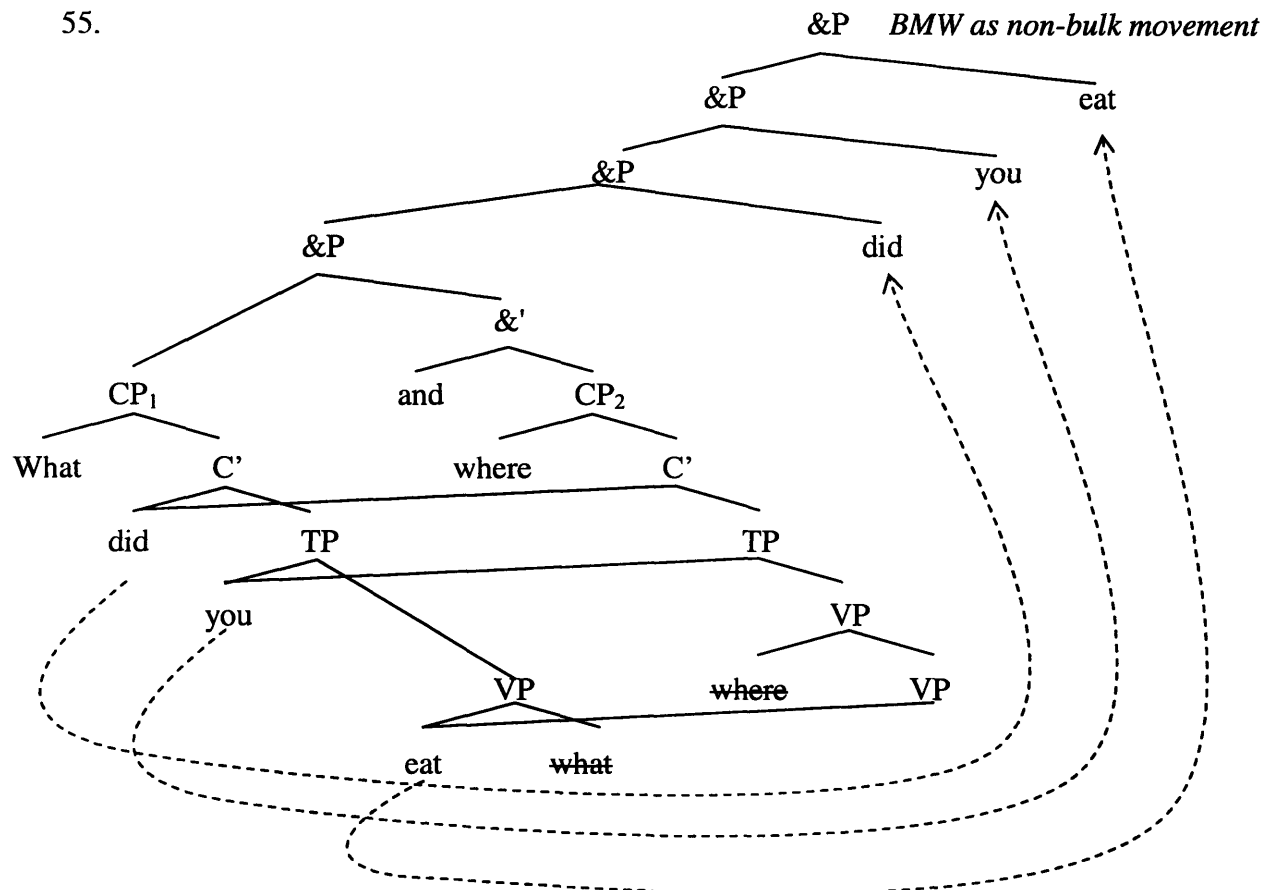
I therefore conclude that neither bulk sharing, nor rightward ATB movement can account for the properties of BMWs presented in Chapter 2.

5. *Against non-bulk movement*

In previous sections we have seen arguments that analyses of clausal BMWs which have been proposed in the literature (backwards sluicing), or would be plausible to propose (bulk sharing, with or without movement) cannot capture properties of a BMW. However, before we conclude that non-bulk sharing is the only reasonable way to derive the surface string in a BMW from underlyingly coordinated clauses, there is another analysis that needs to be considered. This analysis involves rightward movement of each shared terminal node. This is illustrated in (55) for the sentence in (54).

54. What and where did you eat?

55.



Note first that random movement of terminal nodes to the right, as is the one we are entertaining at the moment, is normally not allowed. Sentences in (56) and (57) are ill-formed.

56. *Bob Sally a diamond gave.

57. *Who Bob see did?

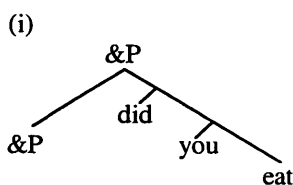
A reason for this may be the fact that, under the present proposal, the shared elements are heads. Therefore, the rightward movement that they putatively undergo in (55) should be head movement. Head movement is known to be constrained not only by locality, i.e. by Head Movement Constraint (Travis, 1984), but also by the landing site. Chomsky (1986) and Kayne

(1994) argue that adjunction of a head to a non-head should be prohibited. In (55), and arguably also in (56) and (57), the moving head right-adjoins to an XP. Given this observation, the non-bulk movement analysis of BMWs seems implausible.

Moreover, there seems to exist empirical evidence that such movement in a BMW is disallowed. An argument against it comes from the fact that in (55), the c-command relations among the moved elements, *did*, *you* and *eat* in their re-merged positions would be reversed with respect to their original positions. In the original position, *did* c-commands *you* and *you* c-commands *eat*, but in the remerged position, *eat* c-commands *you* and *you* c-commands *did*. The fact that in the linear order *did* precedes *you* and *you* precedes *eat* shows that the original c-command relations in the re-merged positions were not preserved after the re-merge.⁸⁸ If this is the case, we would expect that in a sentence like that in (54), the new c-command relations have repercussions for the relative scope of the moved elements.

Consider, for example, the long-distance question in (58). The sentence contains two quantified DPs, *some professor* and *every girl*. Given clause boundedness of QR, the universal quantifier *every girl* in the object position of the embedded clause cannot take scope higher than

⁸⁸ As far as I can tell, c-command relations following individual movements of shared elements could remain undisturbed only if *eat* moves first and adjoins to &P, after which *you* moves and left-adjoins to it. Finally, *did* moves and left-adjoins to the complex object *you did*. This is illustrated in (i). This scenario violates the extension condition on movement, since *you* and *did* do not extend the root. However, given that moving elements are heads, this might not be problematic, since head-movement virtually never extends the tree (but see (Matushansky, 2006) and (Kučerová, 2005) for a view under which head movement is seen as a tree-extending operation). However, this scenario also involves moving the *lowest* element first, which might be problematic, depending on how movement that is presumably not feature-driven is implemented.



the indefinite subject of the matrix clause, *some professor*. Example (58) only has the surface scope reading; inverse scope is impossible.

58. What did some professor think that Peter sang to every girl? $\exists > \forall, * \forall > \exists$

If in a BMW all shared terminals undergo remerge to &P, along the lines of (55), we would expect the inverse scope in the BMW in (59) to be possible, contrary to fact.

59. What and where did some professor think that Peter sang to every girl? $\exists > \forall, * \forall > \exists$

For all the reasons given in this subsection, I conclude that non-bulk movement analysis is not a plausible alternative to the proposed non-bulk sharing analysis of BMWs.

6. Conclusion

In this chapter I considered alternative analyses of BMWs. These included backwards sluicing, bulk-sharing and non-bulk movement. We saw arguments against all of them. Backwards sluicing was excluded as a possible analysis of BMWs based on arguments from scope parallelism, observed in sluicing, but not in BMWs. Bulk sharing proposals were shown to lead to several wrong predictions, all of which have to do with interpreting traces/copies of moved wh-phrases inside the shared constituent. Finally, we saw that the non-bulk movement analysis faces a conceptual problem that has to do with adjunction of heads to a non-head, as well as an empirical problem in not deriving the correct scope relations in a BMW.

Chapter 6: BMWs and CMWs in Croatian

1. Introduction

In Chapter 2, I argued that in Croatian, *Wh&Wh*'s with repeated clitics are derived from CP coordination, i.e. that they are BMWs (Chapter 2, section 3). Here, I will present evidence that in Croatian, a surface string may be generated that mimics a BMW in that it also contains coordinated wh-phrases at the beginning of the clause, but differs from BMWs we have seen so far in the fact that it contains only one (set of) clitic(s). We will see evidence that a subset of these questions are BMWs proper – i.e. they are derived from two coordinated CPs and have all the properties that BMWs with repeated clitics do. However, we will also see that some of the single-cliticed *Wh&Wh*'s are in fact a completely different phenomenon. In particular, I will show that they do not have a derivation that involves two coordinated clauses, but are in fact derived from a single clause through multiple wh-movement. I will refer to these as *CMWs* (Coordinated Multiple Wh-questions). The distinction between BMWs and CMWs in Croatian indicates that *Wh&Wh*'s that have so far been identified as one structure in the literature, are in fact a diverse set, and that some languages have only one variety (English), while some have both (Croatian). In the rest of the chapter, as I have been doing so far, I use the term *Wh&Wh* in order to refer to the surface string of these questions without making reference to their appropriate analysis.

Let us look at some data. In examples (26)a and (26)b of Chapter 2, repeated here as (1)a and (1)b, we saw that clitics, when they are not repeated, may follow either the first wh-word of a *Wh&Wh* or the second one. I will call the first option **Cl-&**, because clitics precede the conjunction, and the second option **&-cl**, since here clitics follow the conjunction.

1. a. Što MU JE i zašto Petar pjevao?

Wh1-clitics

What him.cl *Aux.cl* and why Petar sung

‘What and why did Petar sing to him?’

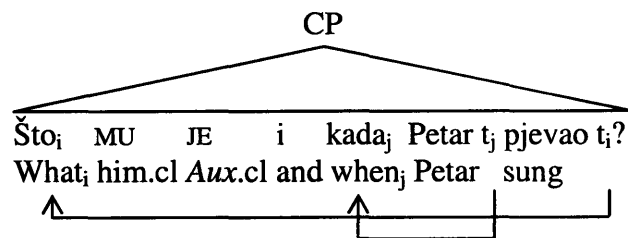
b. Što i zašto MU JE Petar pjevao?

Wh2-clitics

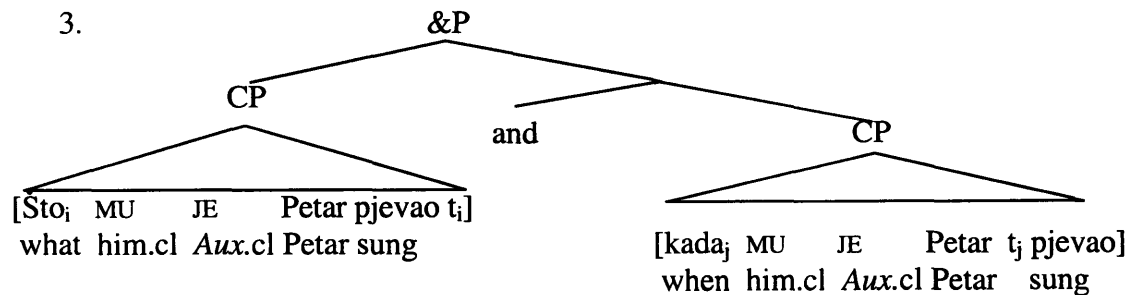
What and why him.cl *Aux.cl* Petar sung

I will argue that **Cl-& Wh&Wh**’s like (1)a must be derived from a mono-clausal structure, illustrated in (2). Examples like (1)b, which illustrates an **&-cl Wh&Wh**, will be shown to be ambiguous between being a CMW, with an underlying mono-clausal structure in (2) and a BMW, with a bi-clausal structure in (3).

2.



3.



I will further argue that when **&-cl Wh&Wh**’s are bi-clausal, they are in fact best analyzed by positing non-bulk sharing, as I argued is the case for BMWs with repeated clitics.

The chapter is organized as follows: in section 2 I investigate **&-cl** *Wh&Wh*'s. I show that they may have either a mono-clausal (CMW) or a bi-clausal (BMW) underlying representation. In section 3 I discuss **Cl-&** *Wh&Wh*'s, and show that they display systematically different behavior from *Wh&Wh*'s with repeated clitics. This argues that they cannot be derived from two underlyingly coordinated CPs, i.e. that they instantiate a CMW. Section 4 contains a discussion of what a correct representation for CMWs might be. Section 5 contains concluding remarks.

2. &-cl *Wh&Wh*'s may be both mono- and bi-clausal

Recall from Chapter 2 that arguments for a bi-clausal structure of Croatian *Wh&Wh*'s with repeated clitics (those in which clitics follow *each* wh-phrase) included the following:

- a) The fact that clitics are repeated (Chapter 2, section 3.1.),
- b) The fact that a *Wh&Wh* containing a subject depictive is grammatical, whereas one containing an object depictive is not (Chapter 2, section 3.4.).
- c) The fact that a *Wh&Wh* with an optionally transitive verb is grammatical, whereas one with an obligatorily transitive verb is not (Chapter 2, section 3.3.),
- d) The absence of the *it*-reading (Chapter 2, section 3.2),

Here I will compare the behavior of **&-cl** *Wh&Wh*'s with the behavior of *Wh&Wh*'s with repeated clitics discussed in Chapter 2. We will see in section 2.1 that the fact that in these questions clitics are not repeated is compatible with the possibility that **&-cl** *Wh&Wh*'s have only a bi-clausal analysis, just like *Wh&Wh*'s with repeated clitics do. However, I will argue that **&-cl** *Wh&Wh*'s differ from *Wh&Wh*'s with repeated clitics in that they may also be derived from

a mono-clausal structure, i.e. that they are structurally ambiguous between being underlyingly bi-clausal and having a mono-clausal underlying structure.

I will bring the following pieces of evidence to bear on the issue. First, I will show that, unlike *Wh&Wh*'s with repeated clitics, **&-cl** *Wh&Wh*'s are grammatical with both optionally and obligatorily transitive verbs. Next, we will see that they can contain both subject and object depictives, again in contrast with *Wh&Wh*'s with repeated clitics. However, when they contain an optionally transitive verb, such as *pjevati* ('sing'), *čitati* ('read') or *jesti* ('eat'), **&-cl** *Wh&Wh*'s have both the *it*-reading and the *at-all*-reading. This will be taken as crucial evidence for structural ambiguity of **&-cl** *Wh&Wh*'s.

Let us first take a look at how the fact that clitics in **&-cl** *Wh&Wh*'s appear only once bears on the question of their structural make-up.

2.1. Non-repeated clitics in **&-cl** *Wh&Wh*'s

&-cl *Wh&Wh*'s contain only one (set of) clitic(s), and they follow the second *wh*-phrase. This is illustrated in (4).

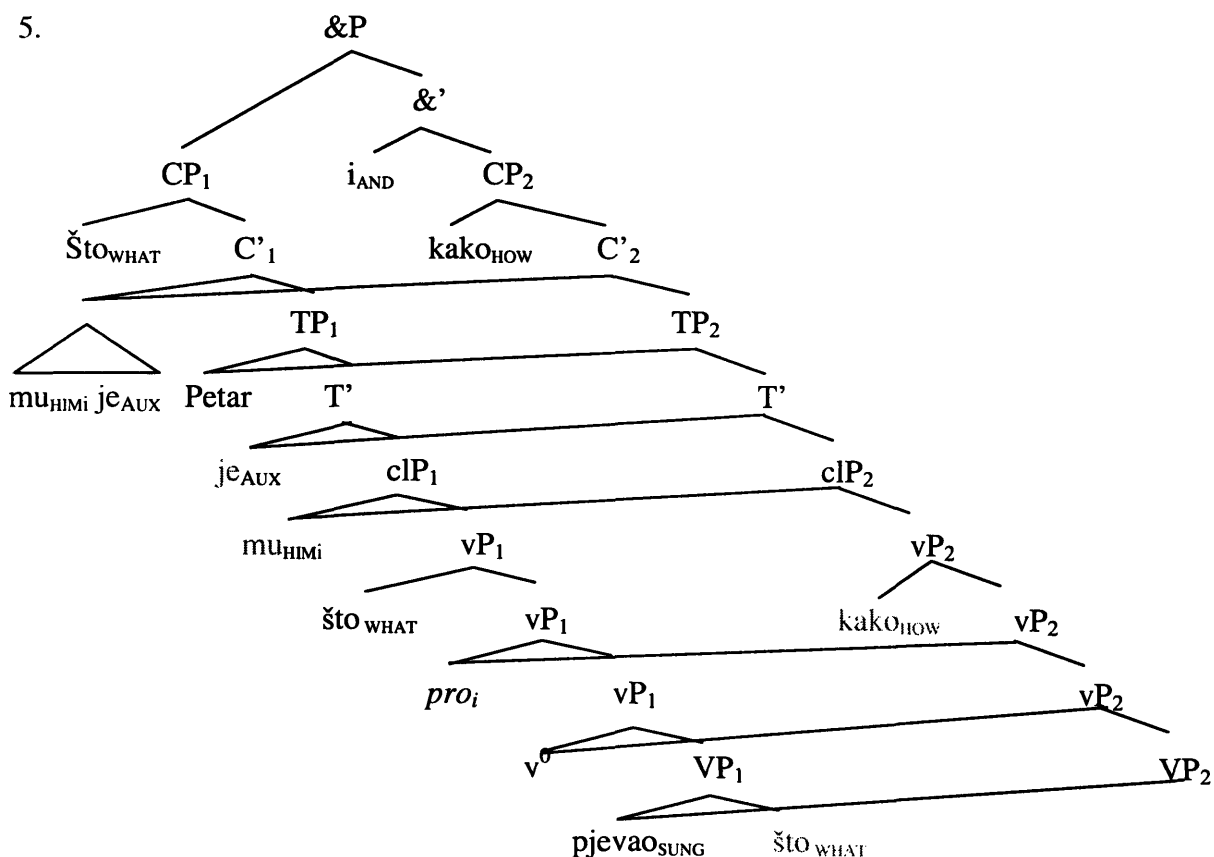
4. Što i kako MU JE Petar pjevao?

What and how him.cl Aux.cl Petar sung

'What and how did Petar sing to him?'

However, this fact alone does not mean that the structure of a **&-cl** *Wh&Wh* must be different from the structure of a *Wh&Wh* with repeated clitics. Recall that I argued that *Wh&Wh*'s with repeated clitics have an analysis in which the underlying structure contains two

separate CPs that share everything *except the wh-phrases and the clitics*. The fact that in those *Wh&Wh*'s clitics are pronounced twice indicates on the one hand that the conjuncts must be clausal, and on the other that the clitics are not shared. However, as hinted in footnote 29 in Chapter 2, it should also be possible to generate two coordinated CPs that *share* clitics. This means that (5) is a possible representation of (4).



I will argue in section 2.4 that the persistent availability of the *at-all*-reading in *&-cl Wh&Wh*'s supports the claim that they *may* have the structure in (5). However, if (5) were the only possible representation of (4), it would mean that *&-cl Wh&Wh*'s are always bi-clausal, and we would expect them to show all the characteristics that *Wh&Wh*'s with repeated clitics do. In

other words, we would expect the two to behave alike with respect to all the properties listed in b) through d) above. However, we will see soon enough that although **&-cl *Wh&Wh*'s** may have the structure in (5), this is not always the case.

2.2. Optionally *versus* obligatorily transitive verbs

We saw in Chapter 2, section 3.3. that Croatian BMWs with repeated clitics are grammatical only when they contain a verb that is optionally transitive. When the verb is obligatorily transitive, the sentence is ill-formed. The relevant examples are repeated here as (6)a and (6)b. I argued in Chapter 2 that the sentence in (6)b is ungrammatical because the verb *popraviti* ('to fix') is missing an internal argument. I took this as evidence for a bi-clausal structure of *Wh&Wh*'s with repeated clitics.

6. a. Što SI MU i zašto SI MU pjevao?

What *Aux.cl* him.cl and why *Aux.cl* him.cl sung

'What and why did you sing to him?'

- b. *Što SI MU i zašto SI MU popravio?

What *Aux.cl* him.cl and why *Aux.cl* him.cl fixed

'What and why did you fix to him?'

Facts are different when we look at **&-cl *Wh&Wh*'s**. There is no contrast in grammaticality between **&-cl *Wh&Wh*'s** that contain an optionally transitive verb and those that contain an obligatorily transitive verb – both are grammatical, as illustrated in (7).

7. a. Što i zašto SI MU pjevao? ✓**cl-& Wh&Wh**: *optionally transitive verb*

What and why Aux.cl him.cl sung

‘What and why did you sing to him?’

- b. Što i zašto SI MU popravio? ✓**cl-& Wh&Wh**: *obligatorily transitive verb*

What and why Aux.cl him.cl fixed

‘What and why did you fix to him?’

The fact that (7)b is grammatical indicates that the object position of the verb *popraviti* (‘to fix’) is filled, presumably by the wh-phrase *što* (‘what’). This means that (7)b cannot have the structure in (5), since in (5) the wh-object, *što* (‘what’) is simply not present in the second conjunct. Thus, (5) cannot be the only possible representation for **&-cl Wh&Wh**’s. There must exist a structure available to **&-cl Wh&Wh**’s, but not to *Wh&Wh*’s with repeated clitics, in which both wh-phrases come from the same clause (or at least in which the wh-object is present in the clause introduced by a wh-adjunct). Putting aside for the moment the question of what this structure is, let us consider what predictions the existence of such a structure makes. As far as I can tell, it predicts two things: first, that unlike *Wh&Wh*’s with repeated clitics, **&-cl Wh&Wh**’s may contain an object depictive, and second, that when a **&-cl Wh&Wh** contains an optionally transitive verb, it is ambiguous with respect to the *it*-reading and the *at-all*-reading. In the following sections we will see that both of these predictions are correct.

2.3. Subject *versus* object depictives

The discussion in Chapter 2 showed that *Wh&Wh*'s with repeated clitics are grammatical when they contain a subject depictive, but not when they contain an object depictive. The relevant examples are repeated here as (8)a and (8)b.

8. a. *Što JE i kada JE Petar jeo sirovo?

What *Aux.cl* and when *Aux.cl* Petar eaten raw

‘What and when did Peter eat raw?’

- b. Što JE i kada JE Petar jeo pijan?

What *Aux.cl* and when *Aux.cl* Petar eaten drunk

‘What and when did Peter eat drunk?’

I argued that the reason for this is the fact that these examples are underlyingly coordinated CPs, and that the second conjunct (the one introduced by an adjunct *wh*-phrase, *kada* (‘when’)) is actually missing an object, which makes an object depictive impossible. By contrast, *&-cl Wh&Wh*'s may contain an object depictive, as well as the subject depictive. This is shown in (9).

9. a. Što i kada JE Petar jeo sirovo? ✓*&-cl Wh&Wh: object depictive*

What and when *Aux.cl* Petar eaten raw

‘What and when did Peter eat raw?’

b. Što i kada JE Petar jeo pijan? ✓&-cl Wh&Wh: *subject depictive*

What and when Aux.cl Petar eaten drunk

‘What and when did Peter eat drunk?’

The absence of contrast between (9)a and (9)b is another indication that there exists a representation of (9)a in which the wh-object *što* (‘what’) is present in the clause introduced by the wh-adjunct *kada* (‘when’).

2.4. The *it*-reading and the *at-all*-reading

Another piece of evidence that I took to be arguing for the bi-clausal structure of *Wh&Wh*’s with repeated clitics involved the absence of the *it*-reading. More precisely, the *Wh&Wh* in (10), repeated here from (30) in Chapter 2, only has the reading in (11)a and not the one in (11)b.

10. Što SI MU i zašto SI MU pjevao?

What Aux.cl him.cl and why Aux.cl him.cl sung

‘What and why did you sing to him?’

11. a. What did you sing to him and why did you sing to him *at all*? *The at-all-reading*

b. # What did you sing to him and why did you sing *that thing* to him? *The it-reading*

Let us now take a look at what readings are available to &-cl *Wh&Wh*’s. If I am correct in claiming that &-cl *Wh&Wh*’s are structurally ambiguous between having an underlying

representation that involves two clauses (as in (5)) and an underlying representation where the two *wh*-phrases belong to the same clause, then **&-cl *Wh&Wh***'s with optionally transitive verbs should have both the *it*-reading and the *at-all*-reading. This is indeed what we find. The sentence in (12) has both the reading in (13)a and the reading in (13)b.

12. Što i zašto SI MU pjevao? **&-cl *Wh&Wh*: optionally transitive verb**

What and why *Aux.cl him.cl sung*

'What and why did you sing to him?'

13. a. What did you sing to him and why did you sing to him *at all*? *The at-all-reading*

b. What did you sing to him and why did you sing *that thing* to him? *The it-reading*

Furthermore, we expect that if an **&-cl *Wh&Wh*** contains an optionally transitive verb *and* an object depictive, the *at-all*-reading is absent. This is because the *at-all*-reading requires a bi-clausal structure in which the *wh*-object is absent from the second conjunct. In such a structure, the presence of an object depictive is impossible. Again, this is a correct prediction. Unlike (12), the sentence in (9)a, repeated here as (14), only has the *it*-reading in (15)a. It does not have the *at-all*-reading in (15)b.

14. a. Što i kada JE Petar jeo sirovo?

What and when *Aux.cl Petar eaten raw*

'What and when did Peter eat raw?'

15. a. What did Petar eat raw and why did Petar eat *it* raw?

The it-reading

b. #What did Petar eat raw and why did Petar eat *at all*?

The at-all-reading

2.5. Interim summary

We saw in section 2.1 that having one set of clitics that follow the second wh-phrase is compatible with a **&-cl** *Wh&Wh* having the structure in (5), which I argued is a correct structure for *Wh&Wh*'s with repeated clitics. That this structure is indeed available to a **&-cl** *Wh&Wh* is supported by the fact that a **&-cl** *Wh&Wh* with an optionally transitive verb has the *at-all*-reading, as we saw in (12) and (13) above. Thus, **&-cl** *Wh&Wh*'s may be BMWs.

However, evidence presented in sections 2.2 through 2.4 argues for the conclusion that the structure in (5) is not the only possible underlying structure for a **&-cl** *Wh&Wh*. The fact that **&-cl** *Wh&Wh*'s may contain an object depictive, that they are grammatical with obligatorily transitive verbs and that in addition to *at-all*-reading they also have the *it*-reading, all suggest that these sentences may instantiate a CMW, i.e. they must also have a representation in which the object wh-phrase and the adjunct wh-phrase are clausemates.

I defer the discussion of what exactly this representation is until after we have discussed the third kind of *Wh&Wh*'s in Croatian, **CL-&** *Wh&Wh*'s, in which clitics follow only the first wh-phrase. We will see in the next section that the mono-clausal representation that is one of the *possible* options for **&-cl** *Wh&Wh*'s is in fact *the only possibility* for **CL-&** *Wh&Wh*'s. This is why in the rest of the Chapter, I refer to **CL-&** *Wh&Wh* as **CL-&** CMWs.

3. *CL-& Wh&Wh's are mono-clausal*

So far in this dissertation, we have seen two types of *Wh&Wh's* in Croatian: those with repeated clitics (BMWs), which I discussed in Chapter 2 and those in which clitics follow only the second wh-phrase (*&-cl Wh&Wh's*), which I discussed in the previous section. In this section we will see the third type of *Wh&Wh's* in Croatian, those in which clitics follow only the first wh-phrase: *Cl-& CMWs*. In most respects, *Cl-& CMWs* behave exactly like *&-cl Wh&Wh's* discussed in section 2 of this Chapter: they are grammatical with both optionally and obligatorily transitive verbs, and they may contain an object as well as a subject depictive. This is illustrated in (16) and (17) below.

16. a. Što SI MU i zašto čitao? ✓*Cl-& CMW: Optionally transitive verb*

What *Aux.cl* him.cl and why read

‘What and why did you read to him?’

b. Što SI MU i zašto ukrao? ✓*Cl-& CMW: Obligatorily transitive verb*

What *Aux.cl* him.cl and why stolen

‘What and why did you steal from him?’

17. a. Što JE i kada Petar jeo sirovo? ✓*Cl-& CMW: Object depictive*

What *Aux.cl* and when Petar eaten raw

‘What and when did Peter eat raw?’

b. Što JE i kada Petar jeo pijan? ✓*Cl-& CMW: Subject depictive*

What *Aux.cl* and when Petar eaten drunk

‘What and when did Peter eat drunk?’

There is, however, one important difference between the two: while a **&-cl Wh&Wh's** with an optionally transitive verb has both the *it*-reading and the *at-all*-reading, a **CI-& CMW** always lacks the *at-all*-reading. Thus, (18) contrasts with (12) in that it does not have the reading in (19)a.

18. Što SI MU i zašto pjevao? **CI-& CMW: Optionally transitive verb**

What *Aux.cl* him.cl and why sung

'What and why did you sing to him?'

19. a. # What did you sing to him and why did you sing to him *at all*? **The at-all-reading**

b. What did you sing to him and why did you sing *that thing* to him? **The it-reading**

The fact that *at-all*-reading seems to *always* be absent in **CI-& CMWs** argues for the claim that these CMWs cannot have a bi-clausal analysis. This means that they cannot have the underlying structure in (5). The conclusion that emerges is that **&-cl Wh&Wh's** are structurally ambiguous between the representation in (5) and what I was referring to as a mono-clausal analysis, while the latter is *the only* possibility for **CI-& CMWs** that are under discussion here.

We have now seen all three types of Croatian *Wh&Wh's*: those with repeated clitics, those in which clitics follow only the second wh-phrase (**&-cl Wh&Wh's**), and those in which clitics follow only the first wh-phrase (**CI-& CMWs**). I argued that *Wh&Wh's* with repeated clitics are always bi-clausal, i.e. that they are BMWs, while **&-cl Wh&Wh's** are ambiguous between being BMWs and CMWs. Finally, I argued that **CI-& Wh&Wh's** are always mono-

clausal, i.e. that they are uniformly CMWs. The discussion of the properties of these types of *Wh&Wh*'s is summarized in (20) below.

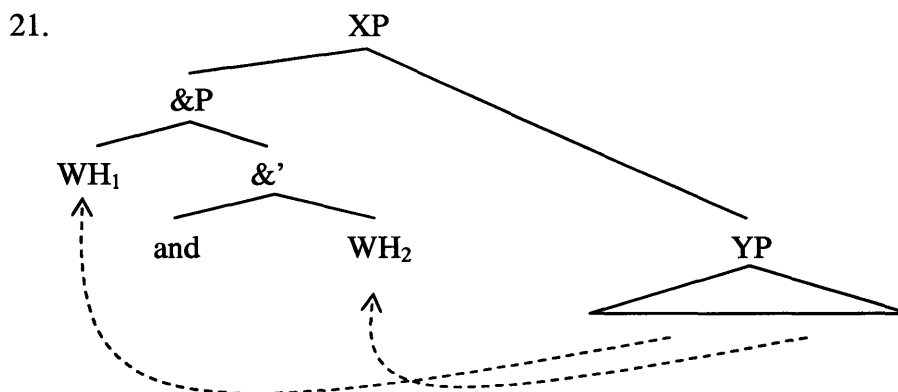
20.	Repeated clitics	&-cl	Cl-&
	✗obligatorily	✓ <u>obligatorily</u>	✓ <u>obligatorily</u>
	transitive verb	<u>transitive verb</u>	<u>transitive verb</u>
	✗object depictive	✓ <u>object depictive</u>	✓ <u>object depictive</u>
	✗ <i>it</i> -reading	✓ <u><i>it</i>-reading</u>	✓ <u><i>it</i>-reading</u>
	✓subject depictive	✓subject depictive	✓subject depictive
	✓optionally	✓optionally	✓optionally
	transitive verb	transitive verb	transitive verb
	✓ <i>at-all</i> -reading	✓ <i>at-all</i> -reading	✗ <i>at-all</i> -reading

I argued in Chapter 2 that in order to derive the *at-all*-reading and the impossibility of both an object depictive and an obligatorily transitive verb in a BMW, we need to postulate an analysis that involves non-bulk sharing of individual terminal nodes in each CP conjunct, *excluding* the *wh*-phrases. In this chapter we saw that a different structure needs to be postulated for CMWs, in order to derive the underlined properties in (20): the presence of the *it*-reading, the availability of an object depictive and obligatorily transitive verb. This structure must allow for *wh*-phrases to be clausemates, which is why I have been referring to this structure as a 'mono-clausal' structure. Let us now take a closer look at what exactly this structure might be.

4. The structure of a CMW

Given the discussion in this chapter, it is clear that in order to correctly capture all the properties of **&-cl** and **Cl-& Wh&Wh's**, we need to posit a structure in which the wh-object and the wh-adjunct belong to the same clause. Such analyses have already been proposed in the literature. An analysis in which wh-phrases are coordinated at the left periphery of the clause have, to my knowledge, been proposed by Zoerner (1995) for English, Liptak (2001) for Hungarian, Kazenin (2000) and Gribanova (Gribanova, 2007) for Russian, Skrabalova (2006) for Czech, and Zhang (2006) for English and Chinese. Proposals differ with respect to the exact structures and derivations argued for by individual authors. For example, Gribanova (2007) proposes that wh-phrases are coordinated in an IP adjoined position, to which they move from the positions where they are externally merged. Skrabalova (2005) follows Camacho (2003) in proposing that syntactic categories are matrices of features, some of which can be inserted in the derivation early, and some later. Skrabalova suggests that the matrices of wh-phrases are base generated in their surface positions, while their theta and case features are inserted in the position that we would consider the canonical position of the original merge. Subsequently, the theta and case features move to join the wh-matrices in [Spec, CP]. Zhang (2006) proposes that the wh-phrases first undergo independent sideward movements (along the lines of Nunes 2001). In the new working space they are conjoined in a coordinate complex, which is then inserted back into the clause. Kazenin (2002) suggests that wh-phrases move to [Spec, CP], where they are then coordinated. For Liptak (2001), the **&P** is generated in the specifier of focus phrase (FocP) *via* Merge. The wh-phrases subsequently move to the two open positions in the **&P** (the specifier and the complement of the conjunction).

Glossing over the peculiarities of each of these proposals, they may be roughly schematically illustrated as in (21).



Any particular instantiation of the analysis in (21) captures the properties of **&-cl** and **Cl-&** CMWs that I underlined in the table in (20). I do not aim in this dissertation to propose a new analysis of mono-clausal CMWs, nor is it my goal to argue for a particular version of a mono-clausal analysis among those that have already been proposed. In other words, I would like to remain agnostic with respect to the exact mechanism that coordinates the wh-phrases in their derived positions.⁸⁹ This means that I will not attempt to answer any of the following obvious and important questions that arise from proposing an analysis along the lines of (21):

- Where does the conjunction come from?
- What allows the coordination of items with distinct categorial information (in

⁸⁹ Note that not everything in the left periphery can be coordinated. For example, a topicalized/scrambled object and a topicalized/scrambled adverbial may not be coordinated when neither is a wh-phrase, or when only one is.

- (i) *Serenadu (je) i svaki utorak (je) Petar pjevao.
Serenade *Aux.cl* and every Tuesday *Aux.cl* Petar sung
'A serenade and every Tuesday Petar sang.'
- (ii) *Što (je) i svaki utorak (je) Petar pjevao?
What *Aux.cl* and every Tuesday *Aux.cl* Petar sung
'What and every Tuesday did Petar sing.'

violation of Williams' (1981) Law of Coordination of Likes)?⁹⁰

- What forces the obligatory single pair reading of these questions?

While finding answers to these questions is an important task that any analysis of CMWs should accomplish, in this dissertation I only want to emphasize the fact that whatever the correct analysis of CMWs might be, it must exist alongside the bi-clausal analysis that I proposed in Chapter 2.

I would like, however, to draw the reader's attention to the fact that an analysis like that in (21) makes the correct predictions with respect to the possible position of clitics in **Cl-&** and **&-cl** CMWs. Recall that descriptively speaking, Croatian clitics may follow either the first word or the first maximal projection in their CP.⁹¹ The position of clitics in **Cl-&** and **&-cl** CMWs follows straightforwardly from the analysis in (21): in the case of **Cl-&** CMWs, clitics seem to follow the first word in the clause,⁹² while in the case of **&-cl** CMWs, they follow the first maximal projection in the clause, i.e. the whole &P. This is schematically illustrated in (22).

22. a. [_{CP} [_{&P} [wh₁] **CL** and [wh₂]]] *Cl-& CMW*

23. b. [_{CP} [_{&P} [wh₁] and [wh₂]] **CL**] *&-cl CMW*

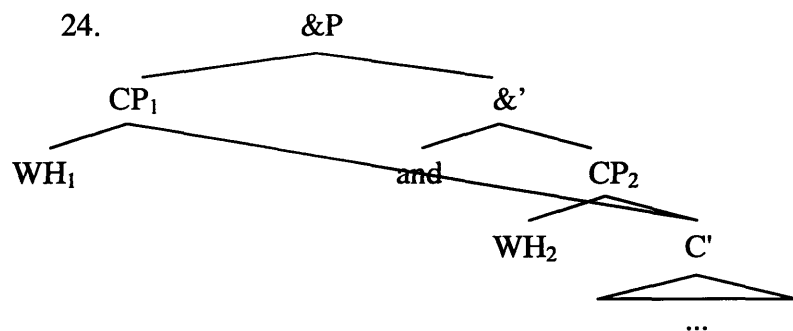
⁹⁰ Liptak (2001) proposes that categorially distinct elements may be coordinated when both conjuncts bear emphatic stress.

⁹¹ In Halpern's (1995) description, clitics may follow the 'first phonological word or the first syntactic daughter of the constituent within which the clitic is second' (pg. 15).

⁹² If the wh-object is a complex phrase, as is the case in (i), clitics may follow either the whole phrase (i)a, or its first word (i)b. For our purposes, this is not a significant difference – both examples display mono-clausal behavior.

- (i) a. Koju pjesmu je i kada Ivan pjevao?
Which song Aux.cl and when Ivan sung
'Which song did Ivan sing and when?'
b. Koju je pjesmu i kada Ivan pjevao?
Which Aux.cl song and when Ivan sung

This is important because at this point, the reader might correctly suggest that the set of characteristics that I underlined in (20) would also fall out from a representation in which the coordination involves two CPs that *bulk* share everything except the remerged positions of the wh-phrases, i.e. everything except the [Spec, CP] positions. This possibility is illustrated in (24).



Given that in (24) each conjunct contains the lower copies of both wh-phrases, the availability of the *it*-reading, the possibility of obligatorily transitive verb and of an object depictive follow straightforwardly.⁹³ Indeed, (24) may well be the correct representation of **&-cl** CMWs (although, see below for a discussion of why it is not probable). However, there is a problem for the analysis in (24) that the analysis in (21) does not face, and it concerns the position of clitics in **Cl-&** CMWs. More precisely, under the assumptions that I have been making in the dissertation so far, i.e. that clitics end up in the second position by moving there in the course of the *syntactic* derivation, it would be impossible to derive a **Cl-&** CMW in which clitics follow only the first wh-phrase from a representation like that in (24). Consider the **Cl-&** CMW in (25).

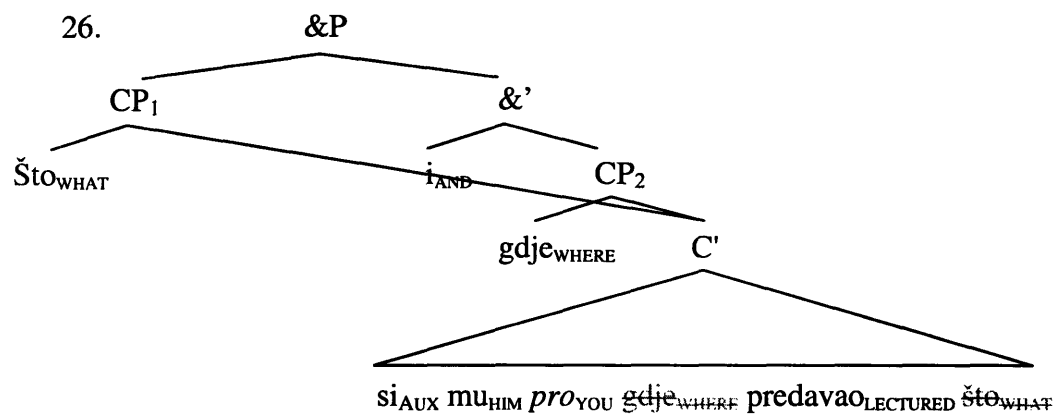
⁹³ Assuming that there is a mechanism that results in interpreting unbound copies of wh-phrases as pronouns, as seems to be the case in *trace-sluicing*, discussed in Chapter 5, section 3.1. (See especially footnote 86 in Chapter 5 for relevant considerations.)

25. Što SI MU i gdje predavao?

What *Aux.cl* him.cl and where lectured

‘What and where did you lecture for him?’

The fact that clitics here are pronounced only once indicates that they are shared between the conjuncts, i.e. that they are part of the ‘bulk’ that is shared. This is illustrated in (26).



Recall that the linearization algorithm devised in Chapter 3 relies on c-command. Given the c-command relations in CP₁ and &', the linearization algorithm gives us the orderings in (27).

27. a. CP₁: Što_{WHAT} < si_{AUX} < mu_{HIM} < predavao_{LECTURED}

b. &': i_{AND} < gdje_{WHERE} < si_{AUX} < mu_{HIM} < predavao_{LECTURED}

All that either CP₁ completely dominates is the wh-phrase *što* ('what'). &⁰ completely dominates *i* ('and') and CP₂ completely dominates *gdje* ('where'). Thus, linearizing CP₁ with respect to &⁰ and CP₂, we get the order informally given in (28).

28. *što*_{WHAT} < *i*_{AND} *gdje*_{WHERE}

The order among the terminals in (26) is total, and it is non-contradictory. However, according to this order, the structure in (26) can only be linearized as (29), with the clitics following *both wh-phrases*.

29. Što i gdje SI MU predavao?

What and where *Aux.cl* him.cl lectured

'What and where did you lecture for him?'

Placing the clitics after the first wh-word only, as in (25), is non-derivable, given our linearization algorithm. This order would be contradictory, since by (27)b, clitics must follow *i* ('and') and *gdje* ('where'), and in (25) they precede it.

However, imagine that the second position for clitics may (optionally) be calculated in a post-syntactic component. An analysis of clitic placement along these lines has been proposed by Halpern (1992, 1995), Zec and Inkelas (1990), Ćavar & Wilder (1994), Radanović-Kocić (1996) among others. In other words, imagine that there is something special about clitics (their phonological make-up or their phonological subcategorization frame) that allows them to 'move' in the PF component of grammar. Since our linearization algorithm refers to c-command, the

relation that crucially depends on structural relations among syntactic nodes, it is not implausible to suppose that it would not have access to a post-syntactic part of the derivation. If these assumptions can be upheld, it is possible to imagine that clitics may undergo (an additional) ‘movement’ after the syntactic derivation is completed. Suppose that this is true. Given that under this view (the final) clitic movement happens in the phonology, not in syntax, it is plausible to assume that a rule that places clitics in the second position may no longer make reference either to ‘maximal projections’ or to ‘syntactic daughters’. However, it could still make reference to phonological words and place the clitics so that they follow the first phonological word in their spell-out domain (where the spell-out domain would have to be the whole &P). We would then expect for clitics to be able to follow the first phonological word in the entire string. Such a rule would in our case correctly place clitics after the first *wh*-phrase in a **Cl-&** CMW.

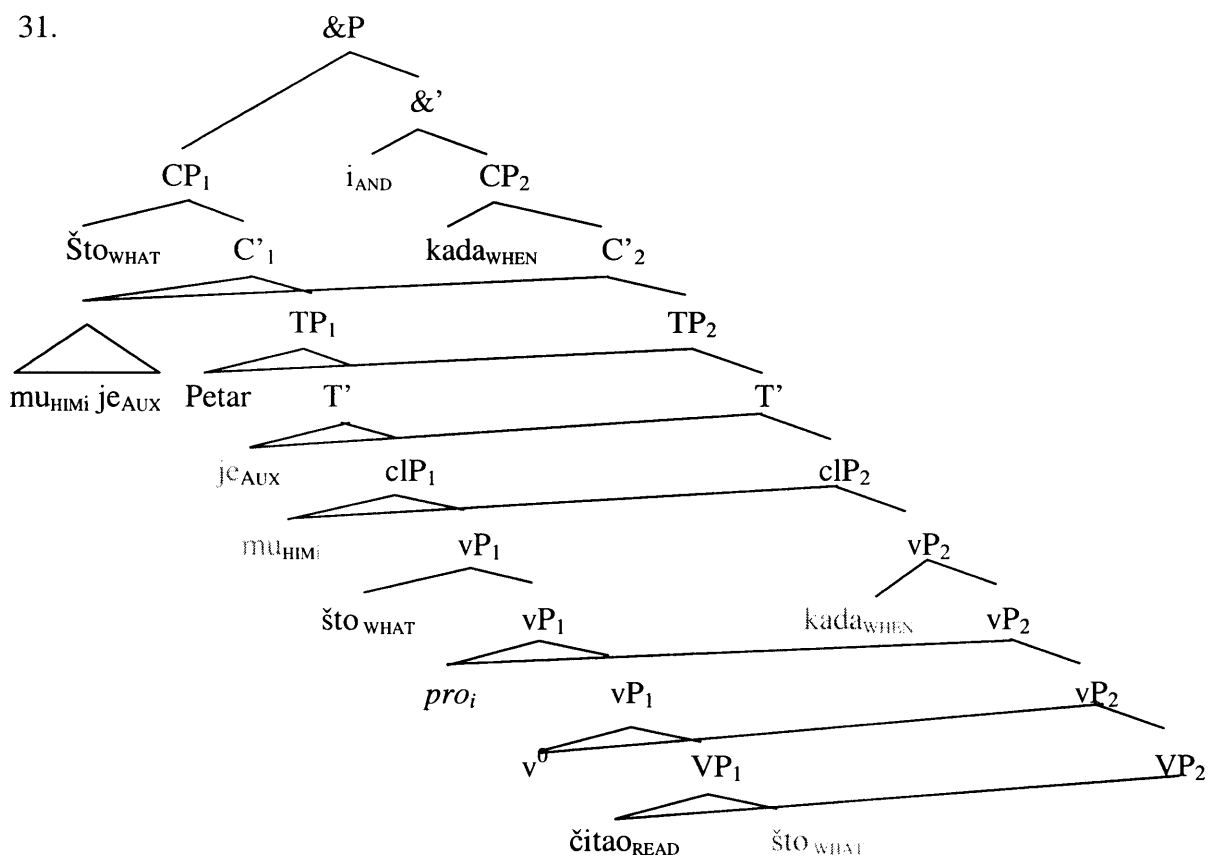
I believe that an argument can be made against the view I just presented. Evidence against it comes from the positions of clitics in **&-cl** *Wh&Wh*’s. Recall that these *Wh&Wh*’s have both the *it*-reading and the *at-all*-reading (see (12) and (13) above). I would like to concentrate here on the presence of the *at-all*-reading. In Chapter 2 I argued that the *at-all*-reading may only be derived from a representation in which (i) the conjuncts in a *Wh&Wh*’s are clausal, and (ii) they do not share neither lower nor higher copies of *wh*-phrases. As mentioned in section 2.1 above, this argues that a **&-cl** *Wh&Wh* such as the one in (30), when it has the *at-all*-reading, is best represented by the tree in (5), repeated here as (31). Thus, we are interested here in a **&-cl** *BMW*.

30. Što i kada MU JE Ivan čitao?

What and when him.cl Aux.cl Ivan read

‘What did Ivan read to him and when did Ivan read to him *at all*?’

31.



In (30)/(31) the clitics are shared – they appear only once in the string, and they follow the second wh-phrase. If it were possible for clitics to ‘move’ in the PF component of grammar, the prediction is that they would be able to follow the first wh-phrase as well. The string thus obtained would be homophonous with the **CI-&** CMW in (32). However, we would not expect the availability of the *at-all*-reading to be affected by this movement, contrary to fact. The **CI-&** CMW in (32) still only has the *it*-reading.

32. Što MU JE i kada Ivan čitao?

What him.cl *Aux.cl* and when Ivan read

‘What did Ivan read to him and when did Ivan read *that thing* to him?’

#‘What did Ivan read to him and when did Ivan read to him *at all*?’

Given this state of affairs, I conclude that the representation in (26) cannot be correct at least for **CI-&** CMWs, which show only the mono-clausal properties.⁹⁴ An analysis like that in (21), on the other hand, seems to be able to explain all the observed properties of both **CI-&** and **&-cl** CMWs, without running into problems with clitic placement. If we make a plausible assumption that the mono-clausal properties of both **&-cl** and **CI-&** CMWs are derived from the same structure, then it must be a structure along the lines of (21). That this assumption is plausible is corroborated by the following set of data from **&-cl** *Wh&Wh*’s.

33. Što i koji dan je Ivan saznao da je Marko zapjevao prošli utorak.

What and which day *Aux.cl* Ivan find-out that *Aux.cl* Marko start-singing last Tuesday

‘What and which day did Ivan find out that Marko started singing last Tuesday?’

(33) is a grammatical **&-cl** *Wh&Wh*. What makes (33) relevant in this context is that the two *wh*-phrases, *što* (‘what’) i *koji dan* (‘which day’) come from different clauses: *što* (‘what’) is extracted out of the embedded clause, while *koji dan* (‘which day’) is extracted out of the matrix clause. That this is so is ensured by the use of the adverbial phrase *prošli utorak* (‘last Tuesday’)

⁹⁴ Note that this argument holds even if clitic placement is *entirely* phonological. In other words, even if the movement that places clitics in the second position in any CMW *always* happens in the phonology, the absence of the *at-all*-reading in (32) still argues against the structure in (26). It seems that the second position for clitics in a CMW is always calculated relative to the individual conjuncts, and not to the sentence as a whole.

in the embedded clause, which makes the use of the wh-phrase *koji dan* ('which day') implausible when construed with the embedded event (singing).⁹⁵

Keeping this in mind, let us consider the possible meanings of (33). Since (33) is an instance of **&-cl Wh&Wh**, we expect it to be ambiguous between the *it*-reading and the *at-all*-reading, as we saw was the case with all **&-cl Wh&Wh**'s (that do not contain an object depictive). However, this is not so. (33) only has the *at-all*-reading, in (34); the *it*-reading is absent. As expected, an object depictive is also banned from a comparable *Wh&Wh* in (35).

34. What did Ivan find out that Marko started singing last Tuesday, and which day did Ivan find out that Ivan started singing *at all* last Tuesday?

35. *Što i koji dan se Petar sjetio

What and which day REFL.cl Petar remembered

da je Ivan prošli utorak jeo sirovo?

that Aux.cl Ivan last Tuesday eaten raw

'What and which day did Petar remember that Ivan ate raw last Tuesday?'

The reader might find it surprising that (33) does not have the *it*-reading and that an object depictive is not possible in (35), indicating that these **&-cl Wh&Wh**'s suddenly cannot be derived from a mono-clausal representation, contrary to what I have been arguing for so far.

⁹⁵ It cannot be the case that the first wh-word, *što* ('what') is extracted out of the matrix clause, and that it has undergone the so-called 'partial wh-movement' (Dayal, 1994, Fanselow and Ćavar, 2000, Fanselow, 2005). Although Croatian seems to allow partial wh-movement, it always involves a wh-phrase in the embedded [Spec, CP], as in (i).

- (i) Što se Petar sjetio, što je Ivan zapjevao?
 What REFL.cl Petar remembered what Aux.cl Ivan started-singing
 'What did Petar remember that Ivan started singing?'

However, there is a plausible explanation for these facts. In Croatian, two or more *wh*-phrases may be fronted only if they are clausemates. This is shown by the ungrammaticality of the multiple *wh*-question in (36). Since in (33) and (35) the *wh*-phrases crucially belong to different clauses, fronting both of them would be ruled out by whatever rules out (36). This argues for the claim that, when derived from a mono-clausal structure, the derivation of *Wh&Wh*'s in Croatian actually involves multiple *wh*-movement.

36. *Tko je kome t_{TKO} sanjao da je Ivan dao knjigu t_{KOME}?

Who *Aux.cl* to-whom t_{WHO} dreamed that *Aux.cl* Ivan given book t_{TO-WHOM}

'Who dreamed that Ivan gave a book to whom?'

Note, however, that this explanation for the absence of the *it*-reading in (33) and the impossibility of an object depictive in (35) holds only if the mono-clausal structure of a CMW is taken to be the one in (21). If the correct underlying representation of mono-clausal CMWs involves a structure in (26), the observed absence of mono-clausal properties in (33) and (35) remains mysterious. This is because under this hypothesis, there is only one *wh*-phrase in each coordinated CP (CP₁ and CP₂) that moves. As shown in (37) and (38) below, neither of these movements is banned in isolation:

37. Što je Ivan saznao da je Marko zapjevao prošli utorak.

What *Aux.cl* Ivan find-out that *Aux.cl* Marko start-singing last Tuesday

'What did Ivan find out that Marko started singing last Tuesday?'

38. Koji dan je Ivan saznao da je Marko zapjevao prošli utorak.

Which day *Aux.cl* Ivan find-out that *Aux.cl* Marko start-singing last Tuesday

'Which day did Ivan find out that Marko started singing last Tuesday?'

The grammaticality of (37) and (38) in conjunction with the observed facts in (33) and (35) argues that the structure in (26) is not a correct structure for CMWs.

To sum up, we have seen two arguments against the underlying representation of CMWs in (26). First, we saw that this structure cannot be linearized such that clitics end up preceding the conjunction, as is the case in **Cl-&** CMWs, which invariably possess mono-clausal properties. The structure in (21), on the other hand, does not face this problem. Next, we saw that if (26) is posited as the mono-clausal structure for **&-cl** CMWs, we have no obvious explanation for the fact that **&-cl** *Wh&Wh*'s in which wh-phrases come from different clauses (as in (33) and (35)) only have bi-clausal interpretation. Again, the proposal along the lines of (21) makes the right prediction: if in a CMW the wh-phrases come from different clauses, they cannot both be fronted.

The discussion in this section (or elsewhere in the dissertation) does not contribute to a better understanding of what in the grammar is responsible for the structure in (21). However, I believe that the facts presented here do argue that a structure along these lines must be available.

5. Conclusion

In this chapter I argued that not all *Wh&Wh*'s in Croatian are bi-clausal. In section 2 I presented evidence that **&-cl** *Wh&Wh*'s are ambiguous between having a bi-clausal and a mono-clausal underlying representation, i.e. between being a BMW and a CMW. I supported this claim by showing that **&-cl** *Wh&Wh*'s can contain both obligatorily and optionally transitive verbs (section 2.2), both subject and object depictives (section 2.3), and that they have the *it*-reading as well as the *at-all*-reading (section 2.4). I further argued that the availability of the *at-all*-reading requires an analysis of **&-cl** BMWs that involves non-bulk sharing. In section 3 I examined the characteristics of **Cl-&** *Wh&Wh*'s, arguing that these must involve a mono-clausal representation. Moreover, I presented evidence that the analysis of CMWs cannot involve coordination of two CPs that bulk share everything except the [Spec, CP] positions (section 4). Rather, I suggested that the correct analysis of a CMW involves multiple wh-movement of clausemate wh-phrases to a position at the left periphery of the clause.

Chapter 7: Conclusion

In this dissertation I attempted to define circumstances under which a structure that contains multiply dominated or shared material is well-formed. I argued that it is not the case that a string may only be shared if the only shared node in the structure is the constituent that dominates the entire string (what I called bulk-sharing), even though in much of the literature on multidominance (MD), this seems to be assumed. Instead, I argued that subparts of a string may be shared individually (non-bulk sharing), as long as the structure that the shared material appears in satisfies COSH (Constraint on Sharing), in (1).

1. *Constraint on Sharing*

For any α , M, and N,

where $M \neq N$, and

- i M and N immediately share α , and
- ii M and N horizontally share α , and
- iii there is no node K such that it vertically shares α with both M and N

For any terminal node β , M completely dominates β iff N completely dominates β .

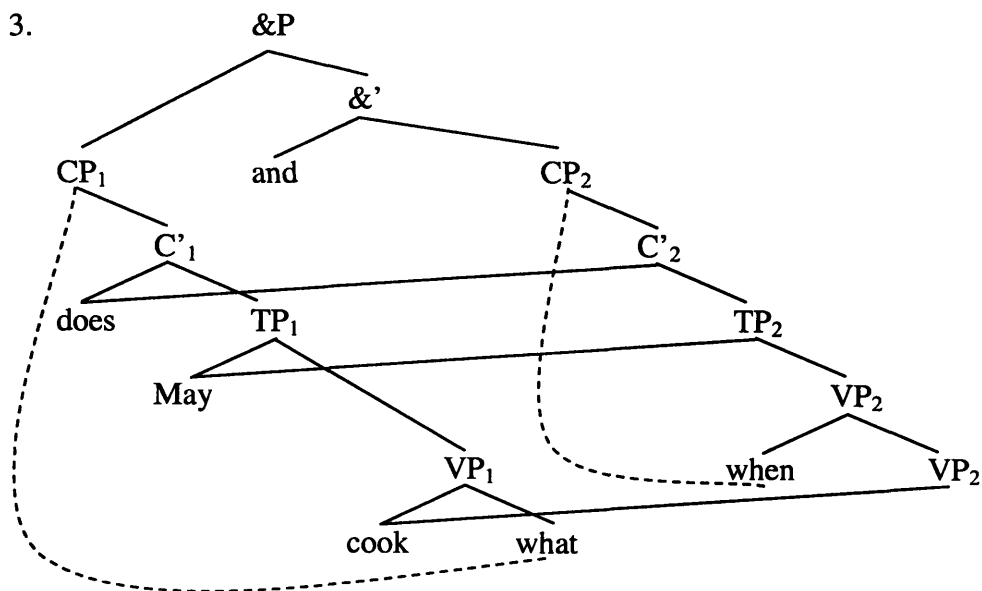
What COSH does is impose an identity requirement on the sets of terminal nodes *completely* dominated by multiple mothers of a *horizontally* shared node α . If by the end of the derivation, no unshared material is completely dominated by a mother of α , the structure is well formed. Unshared material ends up not being completely dominated by mothers of α if it is remerged to a position which is higher than any of the mothers of α . As a result, if a structure

contains non-bulk shared material, no unshared material ends up interleaved with the shared material in the surface string.

In Chapter 2 of the dissertation I present empirical evidence for non-bulk sharing and COSH. There I discussed Bi-clausal Multiple Wh-questions (BMWs), like that in (2), which I argued involve a structure where everything except wh-phrases is non-bulk shared between the two underlyingly clausal conjuncts (as indicated in (2) by underlining).

2. What and when does Mary cook?

We saw in Chapter 5 that properties of BMWs cannot be derived by alternative plausible analyses, such as backwards sluicing, ATB movement and bulk sharing. The structure of a BMW that I argued for in the dissertation is given in (3).



The structure in (3) satisfies COSH, given that, after the remerge of the *wh*-phrases to their respective [Spec, CP] positions, they are no longer completely dominated by the mothers of the shared nodes.

In Chapter 3 I proposed that COSH is a consequence of a linearization principle that takes a syntactic structure as its input and delivers an ordering of all the terminals in it as its output. The linearization algorithm I devised is modeled after Kayne's LCA in that it relies on c-command, but is modified so as to allow for MD structures.⁹⁶ In particular, I proposed that in linearizing a complex constituent *X* with respect to a complex constituent *Y* that *X* c-commands, only terminals *completely dominated by X and Y* are linearized with respect to each other.

To the extent that COSH and the linearization algorithm have the same empirical coverage, it seems promising to think of COSH as a consequence of the fact that structures which do not satisfy it cannot be linearized. However, the structures that obey COSH do not perfectly overlap with structures that can be linearized by the linearization algorithm. In Chapter 4, we saw that COSH and linearization do not make the same predictions for RNR. Thus, once we understand what the analysis of RNR is, it will be a good test to determine which predictions are true: those made by COSH or those made by linearization.

Finally, in Chapter 6, I argued that while in English all *Wh&Wh* questions are BMWs, in Croatian a string that involves apparent coordination of *wh*-phrases at the left periphery of the clause is in fact ambiguous between being a BMW, and having a mono-clausal underlying structure, i.e. being a CMW. I used second position clitics as a diagnostic for distinguishing BMWs from CMWs in Croatian. We saw that those *Wh&Wh* questions in which clitics follow

⁹⁶ I also assumed that right-adjunction and rightward movement are possible, but that c-command from a right-adjointed position translates into subsequence rather than into precedence.

each wh-phrase are obligatorily BMWs, while those in which they follow only the first one are uniformly CMWs. I proposed that the class of *Wh&Wh* questions in which clitics follow only the second wh-phrase are structurally ambiguous between a BMW and a CMW. Finally, I argued that the correct structure for a CMW involves multiple wh-movement of clausemate wh-phrases to the left periphery of the sentence.

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